

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Adrienne Sandoval
Director Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

UPDATED APD COAs 4/11/2019

Operator Signature Date: 9/14/2018

Well information;

Operator Hilcorp, Well Name and Number Sanduen 32-8 Unit 254H

API# 30-045-35882, Section 23 Township 32N, Range 8E

Conditions of Approval: (See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
 - ☐ Hold C-104 for NSL, NSP, DHC
 - ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
 - ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
 - ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
 - ☐ Submit Gas Capture Plan form prior to spudding or initiating recompletion operations
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

NMOC approved by Signature

Date

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 9/14/2008

Well information;

Operator Oil Corp, Well Name and Number Sandwich 328 LNH 254H

API# 30-045-35882, Section 23, Township 32 N S, Range 8 E W

Conditions of Approval: (See the below checked and handwritten conditions)

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- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Beth Roll
NMOCD Approved by Signature

1-3-19
Date

REC'D
DEC 14 2018

UNITED STATES

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

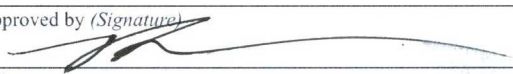
APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMSF0079380
1b. Type of Well: ☐ Oil Well ☐ Gas Well ☒ Other CBNG		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No. SAN JUAN 32-8 / NMNM078424X
2. Name of Operator HILCORP ENERGY COMPANY		8. Lease Name and Well No. SAN JUAN 32-8 UNIT 254H
3a. Address 1111 Travis Street Houston TX 77002	3b. Phone No. (include area code) (713)209-2400	9. API Well No. 30-045-35 882
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface F SENW / 1893 FNL / 1684 FWL / LAT 36.971173 / LONG -107.648047 At proposed prod. zone D NWNW / 293 FNL / 1079 FWL / LAT 36.975648 / LONG -107.667844		10. Field and Pool, or Exploratory BASIN FRUITLAND COAL
11. Sec., T. R. M. or Blk. and Survey or Area SEC 23 / T32N / R8W / NMP		
14. Distance in miles and direction from nearest town or post office*		12. County or Parish SAN JUAN
		13. State NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 293 feet	16. No of acres in lease 1760	17. Spacing Unit dedicated to this well 960
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 100 feet	19. Proposed Depth 3660 feet / 6008 feet	20. BLM/BIA Bond No. in file FED: NMB001486
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6962 feet	22. Approximate date work will start* 04/01/2019	23. Estimated duration 45 days
24. Attachments		

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Priscilla Shorty / Ph: (505)324-5188	Date 09/14/2018
Title Regulatory Technician		
Approved by (Signature) 	Name (Printed/Typed) Richard A. Fields	Date DEC 13 2018
Title Field Manager		
Office FARMINGTON		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

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

DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS"

THIS ACTION DOES NOT RELIEVE THE
LESSEE AND OPERATOR FROM
OBTAINING ANY OTHER AUTHORIZATION
REQUIRED FOR OPERATIONS ON
FEDERAL AND INDIAN LANDS

This action is subject to technical
and procedural review pursuant to
43 CFR 3165.3 and appeal
pursuant to 43 CFR 3165.4

District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-045-35882	*Pool Code 71629	*Pool Name BASIN FRUITLAND COAL
*Property Code 318435	*Property Name SAN JUAN 32-8 UNIT	*Well Number 254H
*OGRIID No. 372171	*Operator Name HILCORP ENERGY COMPANY	*Elevation 6962'

¹⁰ Surface Location

U. S. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	23	32N	8W		1893	NORTH	1684	WEST	SAN JUAN

¹¹ Bottom Hole Location If Different From Surface

TL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	22	32N	8W		293	NORTH	1079	WEST	SAN JUAN

¹² Dedicated Acres	Entire Section 22 W/2 - Section 23	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
960.00				

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

PROPOSED BOTTOM HOLE
293' FNL 1079' FNL
SEC 22, T32N, R8W
LAT: 36.975644°N
LONG: 107.667231°W
DATUM: NAD1927

LAT: 36.975648°N
LONG: 107.667844°W
DATUM: NAD1983

LANDING POINT / POE
1665' FNL 769' FWL
SEC 23, T32N, RBW
LAT: 36.971856°N
LONG: 107.650555°W
DATUM: NAD1927

LAT: 36.971860°N
LONG: 107.651168°W
DATUM: NAD1983

SURFACE LOCATION
1893' FNL 1684' FWL
SEC 23, T32N, R8W
LAT: 36.971169°N
LONG: 107.647435°W
DATUM: NAD1927

LAT: 36.971173°N
LONG: 107.648047°W
DATUM: NAD1983

17 OPERATOR CERTIFICATION

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

Signature: Shusilla Shetty Date: 9/13/18

Priscilla Shorty

Printed Name

pshorty@hilcorp.com

E-mail Address

18 SURVEYOR CERTIFICATION

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

Date Revised: AUGUST 23, 2018

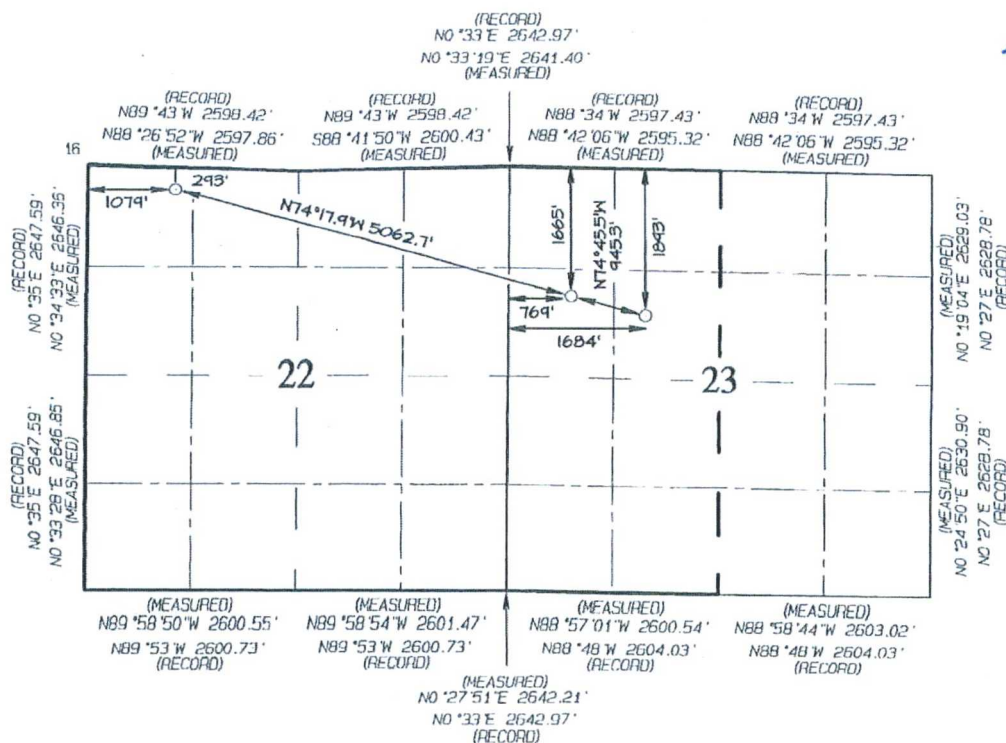
Date of Survey: JUNE 14, 2018

Signature and Seal of Professional Surveyor



JASON C. EDWARDS

Certificate Number 15269



San Juan Unit 32-8 #254H



Hilcorp Energy Company

Technical Plan

1. Location

San Juan Unit 32-8 #254H

SHL: 1893' FNL, 1684' FWL, Sec 23, T32N, R8W

Lat-1 BHL: 293' FNL, 1079' FWL, Sec 22, T32N, R8W

GL: 6962'

2. Geological Markers

Anticipated formation tops with comments of any possible water, gas, or oil shows are indicated below:

Formation	Depth (TVD)	Remarks
Ojo Alamo	2409'	Wet
Kirtland	2444'	Wet
Fruitland	3412'	Possible Gas/Water
Pictured Cliffs	3846'	Wet

See attached directional plan for anticipated formation tops in measured depth.

Susco 16 state 002 was used as the offset for the regional formation tops

3. Pressure Control Equipment

See Attached BOPE & Choke Manifold Schematic for a diagram of pressure control equipment.

- BOPE will be nipped up on top of wellhead after surface casing is set and cemented.
- Pressure control configuration will be designed to meet the minimum 2M standards.
- All equipment will have 3M pressure ratings.
- A rotating head will be rigged up on top of annular as seen in attached diagram.



Hilcorp Energy Company

San Juan Unit 32-8 #254H

4. Casing & Cement Program

A) The proposed casing program is outlined below:

Proposed Casing				
Casing	Hole Size	Casing Size	Weight/Grade	Depth
Surface	12-1/4"	9-5/8"	32.3# H-40	0' - 500' (MD)
Intermediate	8-3/4"	7"	23# L-80	0' - 4,546.9' (MD)
Prod Liner (predrilled)	6-1/4"	4-1/2"	11.6# J-55/L-80	3,990' - 9,050.3' (MD)

The intermediate hole section (pilot hole) will be drilled to target depth, then fully cased and cemented with 7" casing.

A whipstock will be run, and a window will be cut in the 7" casing above the target coal seam to allow for the lateral to be drilled.

First Take Point / Whipstock / casing exit depth is:
Lat1 - 3,979.8' MD / 3,606.3' TVD.

If the 6-1/4" hole is not drilled to total MD, the production liner setting depth and length will be adjusted accordingly.

The 7" casing shoe and the window / casing exit will be set inside the setback boundary line.



Hilcorp Energy Company

San Juan Unit 32-8 #254H

B) The proposed cement program is shown below:

Cement Program						
Interval	Depth (MD)	Sacks	Slurry	Excess	Volume	Planned Cement Top
Surface	500'	265	Lead Cmt: 2% Calcium Chloride, pellet 0.1250 lbm/sk Poly-E-Flake 1.18 ft ³ / sk - 5.24 gal/sk 15.8 ppg	100%	313 ft ³	Surface
Intermediate	4,546.9'	485	Lead Cmt: Varicem Cement 0.3% Super CBL 0.3 % FE-2 5 lbm/sk Kol-Seal 0.125 lbm/sk Poly-E-Flake 2.11 ft ³ / sk - 11.25 gal/sk 12.9 ppg	50%	1025 ft ³	Surface
Production		N/A	N/A - Open hole with pre-drilled liner	N/A	N/A	N/A

Actual cement volumes will be determined and may be adjusted onsite based on well conditions. For the intermediate hole, a 2-stage cement job may be performed if hole conditions indicate during operations. Stage tool will be placed appropriately as conditions indicate.

C) The proposed centralizer program is shown below:

Centralizer Program	
Interval	Centralizers
Surface	1 per joint on bottom 3 joints
Intermediate	10' above shoe joint with collar clamp On top of 2nd, 4th, 6th, 8th, 10th joints 1 every 4th joint to Ojo Alamo 1 every joint through Ojo Alamo 1 Turbolizer will be placed mid-way into Ojo Alamo 1 every 4th joint from top of Ojo Alamo to surface shoe 1 inside surface casing
Production	N/A

To allow adequate time for cement to achieve a minimum of 500 psi compressive strength, a minimum of 8 hours wait on cement time for each hole section will be observed. The



Hilcorp Energy Company

San Juan Unit 32-8 #254H

wellhead will not be installed, casing will not be tested, and the prior casing shoe will not be drilled out until adequate wait on cement time is achieved.

5. Drilling Fluids

A) The proposed drilling fluid program is outlined below:

Mud Program			
Interval	Mud Type	Weight (ppg)	Fluid Loss (cc)
Surface	Air / Water Gel System	Air 8.3 - 9.2	NC
Intermediate	LSND / Gel System	8.4 - 9.5	6 - 16
Production	LSND Brine (if needed)*	8.5 - 10	4 - 14

In the production hole, Brine will be utilized only if a weighting agent is needed to raise MW (for either well control or wellbore stability purposes).

LCM may be added to the mud system if hole conditions indicate.

✓ B) Closed loop equipment will be utilized for solids control. Cuttings from surface, intermediate, and production hole will be hauled to an approved disposal site.

6. Abnormal Pressures & Hazards

- No over-pressured intervals expected.
- Estimated Reservoir Pressure = 1500 psi.
- Maximum anticipated surface pressure = 1,300 psi
- There is some offset Fruitland Coal and Mesa Verde production within the area which could result in these respective formations being under pressured.
- No hydrogen sulfide gas is expected based on nearby well production.

7. Intermediate Hole Section / Pilot Hole

- The intermediate or "pilot" hole section will be drilled through the target Fruitland coal seam.
- GR will be run in the BHA and will be used in conjunction with mud logger data to determine the exact TVD depth of the target coal seam.
- 7" casing will be run completely through the interval, and cemented to surface.



Hilcorp Energy Company

San Juan Unit 32-8 #254H

8. Testing, Logging, Coring

Testing, Logging, Coring Procedure		
Evaluation Method	Start Depth	End depth
Mud Logs	Fruitland Coal Top	TD
MWD Directional Surveys	KOP	TD
LWD GR	7" window	TD
Temp Survey	If needed on intermediate casing	

9. Directional Plan

The planned wellbore directional plan and plot is attached.

The planned directional plan is built off geological targets from offset wells. The production hole will be landed and drilled within target formation horizontally utilizing LWD equipment to help steer the wellbore. On site adjustments will be made to the directional plan as formation and hole indicates.



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.23-T32N-R08W

San Juan 32-8 Unit 254H

Lat 1

Rev0

Anticollision Report

21 August, 2018





Koltek Energy Services

Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 254H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6977.00usft
Reference Site:	Sec.23-T32N-R08W	MD Reference:	KB @ 6977.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 254H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Reference	Rev0
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000.00 usft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program	Date	08/21/18
From (usft)	To (usft)	Survey (Wellbore)
0.00	3,979.81	Rev0 (Pilot Hole)
3,979.81	9,050.32	Rev0 (Lat 1)
Tool Name	Description	
MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec.22-T32N-R08W						
San Juan 32-8 Unit 259 - Original Hole - Original Hole	5,759.55	3,759.80	578.99	507.67	8.118	CC, ES
San Juan 32-8 Unit 259 - Original Hole - Original Hole	5,900.00	3,761.00	595.78	520.81	7.947	SF
Sec.23-T32N-R08W						
San Juan 32-8 Unit 041 - Original Hole - Original Hole	2,411.55	2,411.26	204.65	174.14	6.709	CC
San Juan 32-8 Unit 041 - Original Hole - Original Hole	2,500.00	2,497.80	205.46	173.28	6.385	ES
San Juan 32-8 Unit 041 - Original Hole - Original Hole	2,700.00	2,689.08	218.36	182.55	6.098	SF
San Juan 32-8 Unit 041A - Original Hole - Original Hole	1,084.26	1,075.39	61.70	57.30	14.035	CC, ES
San Juan 32-8 Unit 041A - Original Hole - Original Hole	1,100.00	1,090.55	61.84	57.38	13.867	SF
San Juan 32-8 Unit 254A - Original Hole - Original Hole	415.00	413.02	295.75	288.71	41.984	CC
San Juan 32-8 Unit 254A - Original Hole - Original Hole	2,500.00	2,494.77	300.14	234.82	4.595	ES
San Juan 32-8 Unit 254A - Original Hole - Original Hole	2,700.00	2,686.22	314.54	243.89	4.452	SF
San Juan 32-8 Unit 254H - Pilot Hole - Rev0	3,979.81	3,979.81	0.00	0.00	0.000	Level 1, CC, SF
San Juan 32-8 Unit 254H - Pilot Hole - Rev0	3,987.68	3,987.68	0.05	-0.08	0.396	Level 1, ES

Offset Design											
Sec.22-T32N-R08W - San Juan 32-8 Unit 259 - Original Hole - Original Hole											
Survey Program: 286-MWD											
Offset Site Error: 0.00 usft											
Offset Well Error: 0.00 usft											
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	-105.98	-791.26	-2,763.52	2,876.48		
100.00	100.00	0.00	0.00	0.10	0.00	-105.98	-791.26	-2,763.52	2,874.57	2,874.47	0.10 N/A
120.10	120.10	14.40	14.40	0.14	0.02	-105.98	-791.26	-2,763.52	2,874.56	2,874.41	0.16 N/A
200.00	200.00	90.62	90.62	0.32	0.10	-105.98	-791.25	-2,763.59	2,874.64	2,874.21	0.42 6,805.393
300.00	300.00	186.00	186.00	0.55	0.21	-105.98	-791.22	-2,763.83	2,874.87	2,874.11	0.75 3,810.555
400.00	400.00	286.00	286.00	0.77	0.32	-105.97	-791.17	-2,764.26	2,875.27	2,874.17	1.09 2,633.794
500.00	500.00	506.65	506.19	0.99	0.83	-105.74	-778.81	-2,763.05	2,872.86	2,871.04	1.82 1,576.855
600.00	600.00	673.62	671.27	1.22	1.33	-105.28	-754.19	-2,761.27	2,867.84	2,865.34	2.50 1,146.813
700.00	700.00	814.09	808.19	1.44	1.91	-104.68	-722.93	-2,760.15	2,861.20	2,858.03	3.17 901.877
800.00	800.00	937.63	926.17	1.67	2.56	-103.97	-686.42	-2,759.87	2,853.33	2,849.49	3.84 742.658
900.00	900.00	1,138.80	1,112.43	1.89	3.92	-102.48	-610.67	-2,759.13	2,843.67	2,838.79	4.89 582.091
1,000.00	1,000.00	1,216.00	1,181.60	2.12	4.53	-101.80	-576.39	-2,758.69	2,832.80	2,827.35	5.45 519.676
1,100.00	1,100.00	1,289.65	1,246.93	2.34	5.12	-101.12	-542.39	-2,758.99	2,823.06	2,817.08	5.98 471.972

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.23-T32N-R08W
 Site Error: 0.00 usft
 Reference Well: San Juan 32-8 Unit 254H
 Well Error: 0.00 usft
 Reference Wellbore: Lat 1
 Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
 TVD Reference: KB @ 6977.00usft
 MD Reference: KB @ 6977.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Offset Design Sec.22-T32N-R08W - San Juan 32-8 Unit 259 - Original Hole - Original Hole												Offset Site Error:	0.00 usft
Survey Program: 286-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
1,200.00	1,200.00	1,365.20	1,313.96	2.57	5.70	-100.42	-507.55	-2,759.97	2,814.78	2,808.29	6.49	433.479	
1,300.00	1,300.00	1,451.03	1,390.14	2.79	6.38	-99.62	-468.03	-2,761.27	2,807.44	2,800.41	7.04	398.928	
1,400.00	1,400.00	1,536.26	1,465.74	3.02	7.07	-98.82	-428.71	-2,762.61	2,800.89	2,793.31	7.58	369.660	
1,500.00	1,500.00	1,622.71	1,542.46	3.24	7.76	-98.01	-388.89	-2,764.14	2,795.26	2,787.14	8.12	344.365	
1,600.00	1,600.00	1,715.70	1,625.06	3.47	8.47	-97.14	-346.20	-2,765.64	2,790.25	2,781.60	8.66	322.374	
1,700.00	1,700.00	1,804.68	1,704.33	3.69	9.14	-96.31	-305.81	-2,766.98	2,785.98	2,776.81	9.17	303.809	
1,800.00	1,800.00	1,896.16	1,786.44	3.92	9.83	-95.48	-265.47	-2,768.16	2,782.36	2,772.67	9.69	287.281	
1,900.00	1,900.00	1,987.03	1,868.38	4.14	10.51	-94.67	-226.23	-2,769.23	2,779.42	2,769.23	10.19	272.674	
2,000.00	2,000.00	2,082.48	1,954.74	4.37	11.22	-93.83	-185.59	-2,770.15	2,777.01	2,766.29	10.71	259.189	
2,100.00	2,100.00	2,171.12	2,035.02	4.59	11.89	-93.06	-148.00	-2,770.95	2,775.19	2,763.97	11.21	247.460	
2,122.68	2,122.68	2,189.97	2,052.10	4.64	12.03	-92.89	-140.03	-2,771.13	2,774.88	2,763.56	11.32	245.051	
2,200.00	2,199.97	2,256.85	2,112.76	4.81	12.54	-17.59	-111.87	-2,771.87	2,772.44	2,755.12	17.32	160.058	
2,300.00	2,299.65	2,360.56	2,208.34	5.02	13.26	-16.88	-71.66	-2,772.68	2,764.45	2,746.27	18.18	152.088	
2,400.00	2,398.68	2,459.01	2,300.53	5.25	13.88	-16.37	-37.15	-2,773.05	2,750.79	2,731.92	18.87	145.770	
2,500.00	2,496.67	2,551.82	2,388.50	5.50	14.43	-16.04	-7.59	-2,773.32	2,731.62	2,712.20	19.42	140.657	
2,600.00	2,593.27	2,641.91	2,474.61	5.80	14.92	-15.84	18.89	-2,773.69	2,707.05	2,687.20	19.85	136.366	
2,700.00	2,688.11	2,729.93	2,559.39	6.17	15.37	-15.77	42.56	-2,774.16	2,677.10	2,656.93	20.18	132.692	
2,800.00	2,780.84	2,806.00	2,633.03	6.64	15.74	-15.87	61.60	-2,774.96	2,642.15	2,621.79	20.36	129.769	
2,900.00	2,871.12	2,893.77	2,718.42	7.22	16.14	-16.05	81.83	-2,776.23	2,602.15	2,581.64	20.52	126.839	
3,000.00	2,958.60	3,006.20	2,828.54	7.94	16.59	-16.36	104.48	-2,777.47	2,556.53	2,535.86	20.68	123.651	
3,100.00	3,042.97	3,120.10	2,940.77	8.82	16.99	-16.92	123.89	-2,777.62	2,504.90	2,484.15	20.75	120.702	
3,200.00	3,123.90	3,212.04	3,031.80	9.85	17.26	-17.74	136.70	-2,776.90	2,447.53	2,426.81	20.72	118.145	
3,300.00	3,201.10	3,278.10	3,097.45	11.05	17.44	-18.78	144.01	-2,776.59	2,385.72	2,365.11	20.62	115.718	
3,400.00	3,274.28	3,354.61	3,173.68	12.42	17.60	-20.16	150.57	-2,776.41	2,319.66	2,299.08	20.57	112.747	
3,500.00	3,343.16	3,433.64	3,252.55	13.95	17.74	-21.96	155.60	-2,776.05	2,249.31	2,228.67	20.64	108.989	
3,600.00	3,407.49	3,495.05	3,313.88	15.64	17.84	-24.07	158.66	-2,775.62	2,174.98	2,154.14	20.85	104.339	
3,700.00	3,467.02	3,549.91	3,368.69	17.48	17.92	-26.62	161.01	-2,775.44	2,097.41	2,076.11	21.30	98.476	
3,800.00	3,521.54	3,605.08	3,423.81	19.47	18.00	-29.81	163.31	-2,775.29	2,016.73	1,994.60	22.13	91.131	
3,900.00	3,570.84	3,655.07	3,473.75	21.58	18.08	-33.70	165.40	-2,775.16	1,933.27	1,909.82	23.46	82.423	
3,979.81	3,606.32	3,691.11	3,509.77	23.35	18.13	-37.42	166.91	-2,775.06	1,864.92	1,839.96	24.96	74.710	
4,000.00	3,614.53	3,699.47	3,518.12	23.66	18.14	-39.94	167.26	-2,775.04	1,847.33	1,821.85	25.48	72.515	
4,050.00	3,632.02	3,717.34	3,535.97	24.12	18.17	-47.50	168.00	-2,774.99	1,802.74	1,775.60	27.14	66.424	
4,100.00	3,645.36	3,731.07	3,549.69	24.65	18.19	-57.25	168.58	-2,774.95	1,757.01	1,727.23	29.78	58.995	
4,150.00	3,654.45	3,740.57	3,559.18	25.25	18.20	-69.25	168.97	-2,774.93	1,710.51	1,677.50	33.01	51.815	
4,200.00	3,659.23	3,745.75	3,564.36	25.92	18.21	-82.83	169.19	-2,774.91	1,663.61	1,627.80	35.82	46.447	
4,229.81	3,660.00	3,746.78	3,565.38	26.35	18.21	-91.05	169.23	-2,774.91	1,635.62	1,598.77	36.85	44.388	
4,246.26	3,660.00	3,746.92	3,565.52	26.59	18.21	-91.07	169.24	-2,774.91	1,620.22	1,583.08	37.14	43.620	
4,300.00	3,659.99	3,747.37	3,565.98	27.43	18.22	-91.12	169.26	-2,774.91	1,570.15	1,532.17	37.98	41.340	
4,400.00	3,659.97	3,748.22	3,566.83	29.13	18.22	-91.20	169.29	-2,774.90	1,477.66	1,437.98	39.68	37.238	
4,500.00	3,659.95	3,749.08	3,567.68	30.98	18.22	-91.29	169.33	-2,774.90	1,386.22	1,344.68	41.54	33.372	
4,600.00	3,659.93	3,749.93	3,568.53	32.96	18.22	-91.37	169.37	-2,774.90	1,296.03	1,252.51	43.53	29.775	
4,700.00	3,659.91	3,750.78	3,569.38	35.06	18.22	-91.45	169.40	-2,774.90	1,207.40	1,161.77	45.62	26.464	
4,800.00	3,659.89	3,751.63	3,570.23	37.24	18.22	-91.54	169.44	-2,774.90	1,120.67	1,072.86	47.81	23.440	
4,900.00	3,659.86	3,752.48	3,571.09	39.50	18.22	-91.62	169.47	-2,774.89	1,036.35	986.27	50.07	20.697	
5,000.00	3,659.84	3,753.34	3,571.94	41.82	18.22	-91.71	169.51	-2,774.89	955.05	902.65	52.40	18.227	
5,100.00	3,659.82	3,754.19	3,572.79	44.20	18.23	-91.79	169.54	-2,774.89	877.62	822.84	54.78	16.022	
5,200.00	3,659.80	3,755.04	3,573.64	46.62	18.23	-91.88	169.58	-2,774.89	805.18	747.98	57.20	14.077	
5,300.00	3,659.78	3,755.89	3,574.49	49.08	18.23	-91.96	169.61	-2,774.88	739.19	679.54	59.66	12.390	
5,400.00	3,659.76	3,756.74	3,575.34	51.57	18.23	-92.04	169.65	-2,774.88	681.55	619.39	62.15	10.966	
5,500.00	3,659.74	3,757.59	3,576.19	54.09	18.23	-92.13	169.69	-2,774.88	634.51	569.83	64.67	9.811	
5,600.00	3,659.72	3,758.45	3,577.04	56.64	18.23	-92.21	169.72	-2,774.88	600.57	533.35	67.22	8.934	
5,700.00	3,659.70	3,759.30	3,577.89	59.20	18.23	-92.30	169.76	-2,774.87	582.05	512.26	69.79	8.340	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.23-T32N-R08W
 Site Error: 0.00 usft
 Reference Well: San Juan 32-8 Unit 254H
 Well Error: 0.00 usft
 Reference Wellbore: Lat 1
 Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
 TVD Reference: KB @ 6977.00usft
 MD Reference: KB @ 6977.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Offset Design Sec.22-T32N-R08W - San Juan 32-8 Unit 259 - Original Hole - Original Hole													Offset Site Error: 0.00 usft
Survey Program: 286-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,759.55	3,659.69	3,759.80	3,578.40	60.74	18.23	-92.35	169.78	-2,774.87	578.99	507.67	71.33	8.118 CC, ES	
5,800.00	3,659.68	3,760.15	3,578.74	61.79	18.23	-92.38	169.79	-2,774.87	580.41	508.03	72.37	8.020	
5,900.00	3,659.66	3,761.00	3,579.60	64.39	18.24	-92.47	169.83	-2,774.87	595.78	520.81	74.97	7.947 SF	
6,000.00	3,659.64	3,761.85	3,580.45	67.01	18.24	-92.55	169.86	-2,774.87	626.93	549.35	77.59	8.080	
6,100.00	3,659.61	3,762.70	3,581.30	69.64	18.24	-92.63	169.90	-2,774.87	671.66	591.45	80.22	8.373	
6,200.00	3,659.59	3,763.56	3,582.15	72.28	18.24	-92.72	169.93	-2,774.86	727.47	644.62	82.85	8.780	
6,300.00	3,659.57	3,764.41	3,583.00	74.93	18.24	-92.80	169.97	-2,774.86	792.02	706.52	85.50	9.263	
6,400.00	3,659.55	3,765.26	3,583.85	77.59	18.24	-92.89	170.01	-2,774.86	863.35	775.19	88.16	9.793	
6,500.00	3,659.53	3,766.11	3,584.70	80.26	18.24	-92.97	170.04	-2,774.86	939.92	849.10	90.83	10.349	
6,600.00	3,659.51	3,766.96	3,585.55	82.94	18.24	-93.06	170.08	-2,774.85	1,020.56	927.06	93.50	10.915	
6,700.00	3,659.49	3,767.81	3,586.40	85.62	18.25	-93.14	170.11	-2,774.85	1,104.36	1,008.18	96.18	11.483	
6,800.00	3,659.47	3,768.67	3,587.25	88.31	18.25	-93.22	170.15	-2,774.85	1,190.67	1,091.81	98.86	12.044	
6,900.00	3,659.45	3,769.52	3,588.10	91.00	18.25	-93.31	170.18	-2,774.85	1,278.97	1,177.42	101.55	12.595	
7,000.00	3,659.43	3,770.37	3,588.96	93.71	18.25	-93.39	170.22	-2,774.84	1,368.88	1,264.64	104.24	13.132	
7,100.00	3,659.41	3,771.22	3,589.81	96.41	18.25	-93.48	170.25	-2,774.84	1,460.10	1,353.16	106.94	13.654	
7,200.00	3,659.39	3,772.07	3,590.66	99.12	18.25	-93.56	170.29	-2,774.84	1,552.41	1,442.77	109.64	14.159	
7,300.00	3,659.36	3,772.92	3,591.51	101.83	18.25	-93.65	170.33	-2,774.84	1,645.61	1,533.27	112.34	14.648	
7,400.00	3,659.34	3,773.78	3,592.36	104.55	18.25	-93.73	170.36	-2,774.84	1,739.57	1,624.52	115.05	15.120	
7,500.00	3,659.32	3,774.63	3,593.21	107.27	18.26	-93.81	170.40	-2,774.83	1,834.17	1,716.41	117.76	15.575	
7,600.00	3,659.30	3,775.48	3,594.06	109.99	18.26	-93.90	170.43	-2,774.83	1,929.31	1,808.83	120.47	16.014	
7,700.00	3,659.28	3,776.33	3,594.91	112.72	18.26	-93.98	170.47	-2,774.83	2,024.92	1,901.73	123.19	16.438	
7,800.00	3,659.26	3,777.18	3,595.76	115.45	18.26	-94.07	170.50	-2,774.83	2,120.93	1,995.03	125.91	16.845	
7,900.00	3,659.24	3,778.03	3,596.61	118.18	18.26	-94.15	170.54	-2,774.82	2,217.30	2,088.68	128.62	17.239	
8,000.00	3,659.22	3,778.89	3,597.46	120.92	18.26	-94.23	170.58	-2,774.82	2,313.97	2,182.63	131.34	17.618	
8,100.00	3,659.20	3,779.74	3,598.32	123.65	18.26	-94.32	170.61	-2,774.82	2,410.92	2,276.85	134.07	17.983	
8,200.00	3,659.18	3,780.59	3,599.17	126.39	18.26	-94.40	170.65	-2,774.82	2,508.10	2,371.32	136.79	18.336	
8,300.00	3,659.16	3,781.44	3,600.02	129.13	18.27	-94.49	170.68	-2,774.81	2,605.50	2,465.99	139.51	18.676	
8,400.00	3,659.14	3,782.29	3,600.87	131.87	18.27	-94.57	170.72	-2,774.81	2,703.09	2,560.85	142.24	19.004	
8,500.00	3,659.11	3,783.14	3,601.72	134.62	18.27	-94.66	170.75	-2,774.81	2,800.85	2,655.88	144.96	19.321	
8,600.00	3,659.09	3,784.00	3,602.57	137.36	18.27	-94.74	170.79	-2,774.81	2,898.76	2,751.07	147.69	19.628	
8,700.00	3,659.07	3,784.85	3,603.42	140.11	18.27	-94.82	170.82	-2,774.81	2,996.80	2,846.39	150.41	19.924	
8,800.00	3,659.05	3,785.70	3,604.27	142.86	18.27	-94.91	170.86	-2,774.80	3,094.98	2,941.83	153.14	20.210	
8,900.00	3,659.03	3,786.55	3,605.12	145.61	18.27	-94.99	170.90	-2,774.80	3,193.26	3,037.39	155.87	20.487	
9,000.00	3,659.01	3,787.40	3,605.97	148.36	18.27	-95.08	170.93	-2,774.80	3,291.65	3,133.05	158.60	20.755	
9,050.32	3,659.00	3,787.83	3,606.40	149.74	18.27	-95.12	170.95	-2,774.80	3,341.19	3,181.22	159.97	20.886	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 041 - Original Hole - Original Hole														Offset Site Error: 0.00 usft
Survey Program: 143-INC_ONLY<10														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.00	0.00	1.44	1.44	0.00	0.01	8.43	204.29	30.27	206.53					
100.00	100.00	100.82	100.82	0.10	0.48	8.43	204.23	30.27	206.46	205.89	0.57	361.720		
200.00	200.00	201.00	201.00	0.32	1.22	8.43	204.30	30.27	206.53	204.99	1.54	134.015		
300.00	300.00	301.00	301.00	0.55	2.16	8.43	204.30	30.27	206.53	203.82	2.71	76.251		
400.00	400.00	401.00	401.00	0.77	3.11	8.43	204.30	30.27	206.53	202.65	3.88	53.284		
500.00	500.00	501.00	501.00	0.99	4.05	8.43	204.30	30.27	206.53	201.48	5.04	40.950		
600.00	600.00	601.00	601.00	1.22	4.99	8.43	204.30	30.27	206.53	200.32	6.21	33.252		
700.00	700.00	701.00	701.00	1.44	5.93	8.43	204.30	30.27	206.53	199.15	7.38	27.991		
800.00	800.00	801.00	801.00	1.67	6.88	8.43	204.30	30.27	206.53	197.98	8.55	24.167		
900.00	900.00	901.00	901.00	1.89	7.82	8.43	204.30	30.27	206.53	196.82	9.71	21.262		
1,000.00	1,000.00	1,001.00	1,001.00	2.12	8.76	8.43	204.30	30.27	206.53	195.65	10.88	18.981		
1,100.00	1,100.00	1,101.00	1,101.00	2.34	9.71	8.43	204.30	30.27	206.53	194.48	12.05	17.142		
1,200.00	1,200.00	1,201.00	1,201.00	2.57	10.65	8.43	204.30	30.27	206.53	193.31	13.22	15.627		
1,300.00	1,300.00	1,301.00	1,301.00	2.79	11.59	8.43	204.30	30.27	206.53	192.15	14.38	14.359		
1,400.00	1,400.00	1,401.00	1,401.00	3.02	12.53	8.43	204.30	30.27	206.53	190.98	15.55	13.281		
1,500.00	1,500.00	1,501.00	1,501.00	3.24	13.48	8.43	204.30	30.27	206.53	189.81	16.72	12.354		
1,600.00	1,600.00	1,601.00	1,601.00	3.47	14.42	8.43	204.30	30.27	206.53	188.64	17.89	11.547		
1,700.00	1,700.00	1,701.34	1,701.34	3.69	15.50	8.43	204.18	30.27	206.41	187.22	19.19	10.754		
1,800.00	1,800.00	1,801.16	1,801.15	3.92	16.67	8.44	204.06	30.27	206.29	185.71	20.58	10.023		
1,884.00	1,884.00	1,885.00	1,885.00	4.11	17.64	8.44	204.03	30.27	206.26	184.51	21.75	9.484		
1,900.00	1,900.00	1,900.98	1,900.97	4.14	17.83	8.44	204.03	30.27	206.27	184.29	21.97	9.388		
2,000.00	2,000.00	2,000.79	2,000.79	4.37	18.99	8.44	204.09	30.27	206.32	182.96	23.36	8.832		
2,100.00	2,100.00	2,100.61	2,100.60	4.59	20.16	8.43	204.24	30.27	206.47	181.72	24.75	8.342		
2,122.68	2,122.68	2,123.25	2,123.24	4.64	20.42	8.43	204.28	30.27	206.51	181.45	25.06	8.239		
2,200.00	2,199.97	2,201.36	2,201.35	4.81	21.70	83.71	204.15	30.27	206.18	179.67	26.51	7.778		
2,300.00	2,299.65	2,300.96	2,300.95	5.02	23.38	85.89	203.99	30.27	205.31	176.91	28.40	7.230		
2,400.00	2,398.68	2,399.89	2,399.88	5.25	25.04	89.75	203.87	30.27	204.66	174.38	30.28	6.758		
2,411.55	2,410.05	2,411.26	2,411.25	5.27	25.23	90.30	203.86	30.27	204.65	174.14	30.50	6.709 CC		
2,500.00	2,496.67	2,497.80	2,497.78	5.50	26.69	95.16	203.79	30.27	205.46	173.28	32.18	6.385 ES		
2,600.00	2,593.27	2,594.31	2,594.30	5.80	28.31	101.84	203.76	30.27	209.39	175.35	34.04	6.151		
2,700.00	2,688.11	2,689.08	2,689.06	6.17	29.90	109.31	203.77	30.27	218.36	182.55	35.81	6.098 SF		
2,800.00	2,780.84	2,781.74	2,781.73	6.64	31.46	116.97	203.81	30.27	234.10	196.73	37.38	6.263		
2,900.00	2,871.12	2,871.96	2,871.94	7.22	32.98	124.24	203.89	30.27	257.79	219.13	38.66	6.668		
3,000.00	2,958.60	2,959.40	2,959.38	7.94	34.45	130.71	204.00	30.27	289.83	250.21	39.62	7.315		
3,100.00	3,042.97	3,043.73	3,043.71	8.82	35.87	136.22	204.14	30.27	330.04	289.78	40.26	8.197		
3,200.00	3,123.90	3,125.17	3,125.15	9.85	37.25	140.78	204.29	30.27	377.87	337.23	40.65	9.296		
3,300.00	3,201.10	3,202.27	3,202.25	11.05	39.00	144.44	204.15	30.27	432.59	391.44	41.14	10.514		
3,400.00	3,274.28	3,275.37	3,275.35	12.42	40.65	147.31	204.07	30.27	493.63	452.24	41.40	11.924		
3,500.00	3,343.16	3,344.20	3,344.18	13.95	42.21	149.50	204.03	30.27	560.37	518.92	41.46	13.517		
3,600.00	3,407.49	3,408.50	3,408.47	15.64	43.66	151.08	204.03	30.27	632.24	590.86	41.38	15.278		
3,700.00	3,467.02	3,468.03	3,468.00	17.48	45.01	152.11	204.07	30.27	708.72	667.46	41.25	17.179		
3,800.00	3,521.54	3,522.57	3,522.54	19.47	46.24	152.64	204.13	30.27	789.32	748.15	41.17	19.171		
3,900.00	3,570.84	3,571.91	3,571.87	21.58	47.35	152.63	204.21	30.27	873.62	832.33	41.29	21.158		
3,979.81	3,606.32	3,607.43	3,607.40	23.35	48.16	152.22	204.28	30.27	943.25	901.58	41.67	22.637		
4,000.00	3,614.53	3,615.65	3,615.62	23.66	48.34	150.79	204.29	30.27	961.26	919.13	42.13	22.819		
4,050.00	3,632.02	3,633.05	3,633.02	24.12	48.79	146.03	204.30	30.27	1,007.05	962.35	44.70	22.527		
4,100.00	3,645.36	3,646.39	3,646.36	24.65	49.13	138.57	204.30	30.27	1,054.26	1,003.68	50.58	20.843		
4,150.00	3,654.45	3,655.49	3,655.45	25.25	49.36	126.27	204.30	30.27	1,102.52	1,041.86	60.66	18.177		
4,200.00	3,659.23	3,660.26	3,660.23	25.92	49.49	106.04	204.30	30.27	1,151.44	1,078.94	72.50	15.881		
4,229.81	3,660.00	3,661.04	3,661.00	26.35	49.51	90.00	204.30	30.27	1,180.78	1,104.92	75.86	15.566		
4,246.26	3,660.00	3,661.04	3,661.00	26.59	49.51	89.93	204.30	30.27	1,196.97	1,120.87	76.10	15.729		
4,300.00	3,659.99	3,661.02	3,660.99	27.43	49.51	89.93	204.30	30.27	1,249.87	1,172.93	76.93	16.246		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 041 - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 143-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	Distance		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)										
4,400.00	3,659.97	3,661.00	3,660.97	29.13	49.51	89.93	204.30	30.27	1,348.49	1,269.86	78.63	17.150			
4,500.00	3,659.95	3,660.98	3,660.95	30.98	49.51	89.92	204.30	30.27	1,447.30	1,366.81	80.48	17.983			
4,600.00	3,659.93	3,660.96	3,660.93	32.96	49.51	89.92	204.30	30.27	1,546.26	1,463.79	82.47	18.750			
4,700.00	3,659.91	3,660.94	3,660.91	35.06	49.50	89.91	204.30	30.27	1,645.34	1,560.78	84.56	19.458			
4,800.00	3,659.89	3,660.92	3,660.89	37.24	49.50	89.90	204.30	30.27	1,744.54	1,657.79	86.74	20.111			
4,900.00	3,659.86	3,660.90	3,660.86	39.50	49.50	89.90	204.30	30.27	1,843.81	1,754.81	89.00	20.716			
5,000.00	3,659.84	3,660.88	3,660.84	41.82	49.50	89.89	204.30	30.27	1,943.17	1,851.84	91.33	21.277			
5,100.00	3,659.82	3,660.86	3,660.82	44.20	49.50	89.89	204.30	30.27	2,042.58	1,948.88	93.70	21.799			
5,200.00	3,659.80	3,660.84	3,660.80	46.62	49.50	89.88	204.30	30.27	2,142.05	2,045.93	96.12	22.285			
5,300.00	3,659.78	3,660.82	3,660.78	49.08	49.50	89.88	204.30	30.27	2,241.57	2,142.99	98.58	22.739			
5,400.00	3,659.76	3,660.80	3,660.76	51.57	49.50	89.87	204.30	30.27	2,341.13	2,240.06	101.07	23.163			
5,500.00	3,659.74	3,660.77	3,660.74	54.09	49.50	89.87	204.30	30.27	2,440.72	2,337.13	103.59	23.561			
5,600.00	3,659.72	3,660.75	3,660.72	56.64	49.50	89.86	204.30	30.27	2,540.35	2,434.21	106.14	23.935			
5,700.00	3,659.70	3,660.73	3,660.70	59.20	49.50	89.85	204.30	30.27	2,640.01	2,531.30	108.70	24.286			
5,800.00	3,659.68	3,660.71	3,660.68	61.79	49.50	89.85	204.30	30.27	2,739.69	2,628.40	111.29	24.618			
5,900.00	3,659.66	3,660.69	3,660.66	64.39	49.50	89.84	204.30	30.27	2,839.39	2,725.50	113.89	24.931			
6,000.00	3,659.64	3,660.67	3,660.64	67.01	49.50	89.84	204.30	30.27	2,939.11	2,822.60	116.51	25.227			
6,100.00	3,659.61	3,660.65	3,660.61	69.64	49.50	89.83	204.30	30.27	3,038.85	2,919.72	119.14	25.508			
6,200.00	3,659.59	3,660.63	3,660.59	72.28	49.50	89.83	204.30	30.27	3,138.61	3,016.83	121.78	25.774			
6,300.00	3,659.57	3,660.61	3,660.57	74.93	49.50	89.82	204.30	30.27	3,238.38	3,113.95	124.43	26.026			
6,400.00	3,659.55	3,660.59	3,660.55	77.59	49.50	89.82	204.30	30.27	3,338.17	3,211.08	127.09	26.267			
6,500.00	3,659.53	3,660.57	3,660.53	80.26	49.50	89.81	204.30	30.27	3,437.97	3,308.21	129.76	26.496			
6,600.00	3,659.51	3,660.55	3,660.51	82.94	49.49	89.80	204.30	30.27	3,537.78	3,405.34	132.43	26.714			
6,700.00	3,659.49	3,660.52	3,660.49	85.62	49.49	89.80	204.30	30.27	3,637.60	3,502.48	135.11	26.922			
6,800.00	3,659.47	3,660.50	3,660.47	88.31	49.49	89.79	204.30	30.27	3,737.43	3,599.62	137.80	27.122			
6,900.00	3,659.45	3,660.48	3,660.45	91.00	49.49	89.79	204.30	30.27	3,837.26	3,696.77	140.50	27.312			
7,000.00	3,659.43	3,660.46	3,660.43	93.71	49.49	89.78	204.30	30.27	3,937.11	3,793.91	143.20	27.494			
7,100.00	3,659.41	3,660.44	3,660.41	96.41	49.49	89.78	204.30	30.27	4,036.97	3,891.06	145.90	27.669			
7,200.00	3,659.39	3,660.42	3,660.39	99.12	49.49	89.77	204.30	30.27	4,136.83	3,988.22	148.61	27.837			
7,300.00	3,659.36	3,660.40	3,660.36	101.83	49.49	89.77	204.30	30.27	4,236.69	4,085.37	151.32	27.998			
7,400.00	3,659.34	3,660.38	3,660.34	104.55	49.49	89.76	204.30	30.27	4,336.57	4,182.53	154.04	28.152			
7,500.00	3,659.32	3,660.36	3,660.32	107.27	49.49	89.75	204.30	30.27	4,436.45	4,279.69	156.76	28.301			
7,600.00	3,659.30	3,660.34	3,660.30	109.99	49.49	89.75	204.30	30.27	4,536.33	4,376.85	159.48	28.444			
7,700.00	3,659.28	3,660.32	3,660.28	112.72	49.49	89.74	204.30	30.27	4,636.22	4,474.02	162.21	28.582			
7,800.00	3,659.26	3,660.30	3,660.26	115.45	49.49	89.74	204.30	30.27	4,736.12	4,571.18	164.94	28.715			
7,900.00	3,659.24	3,660.27	3,660.24	118.18	49.49	89.73	204.30	30.27	4,836.02	4,668.35	167.67	28.843			
8,000.00	3,659.22	3,660.25	3,660.22	120.92	49.49	89.73	204.30	30.27	4,935.92	4,765.52	170.40	28.966			
8,100.00	3,659.20	3,660.23	3,660.20	123.65	49.49	89.72	204.30	30.27	5,035.83	4,862.69	173.14	29.086			
8,200.00	3,659.18	3,660.21	3,660.18	126.39	49.49	89.72	204.30	30.27	5,135.74	4,959.86	175.88	29.201			
8,300.00	3,659.16	3,660.19	3,660.16	129.13	49.49	89.71	204.30	30.27	5,235.65	5,057.04	178.61	29.313			
8,400.00	3,659.14	3,660.17	3,660.14	131.87	49.48	89.70	204.30	30.27	5,335.57	5,154.21	181.36	29.420			
8,500.00	3,659.11	3,660.15	3,660.11	134.62	49.48	89.70	204.30	30.27	5,435.49	5,251.39	184.10	29.525			
8,600.00	3,659.09	3,660.13	3,660.09	137.36	49.48	89.69	204.30	30.27	5,535.41	5,348.57	186.84	29.626			
8,700.00	3,659.07	3,660.11	3,660.07	140.11	49.48	89.69	204.30	30.27	5,635.34	5,445.75	189.59	29.724			
8,800.00	3,659.05	3,660.09	3,660.05	142.86	49.48	89.68	204.30	30.27	5,735.27	5,542.93	192.34	29.819			
8,900.00	3,659.03	3,660.07	3,660.03	145.61	49.48	89.68	204.30	30.27	5,835.20	5,640.11	195.09	29.911			
9,000.00	3,659.01	3,660.05	3,660.01	148.36	49.48	89.67	204.30	30.27	5,935.13	5,737.29	197.84	30.000			
9,050.32	3,659.00	3,660.04	3,660.00	149.74	49.48	89.67	204.30	30.27	5,985.42	5,786.19	199.22	30.044			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Off-set Design													Sec.23-T32N-R08W - San Juan 32-8 Unit 041A - Original Hole - Original Hole		Offset Site Error:	0.00 usft
Survey Program: 375-MWD															Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.00	0.00	0.00	0.00	0.00	0.00	-57.58	54.81	-86.28	103.46							
100.00	100.00	83.94	83.94	0.10	0.10	-57.69	54.65	-86.41	102.24	102.05	0.19	536.757				
200.00	200.00	183.87	183.86	0.32	0.21	-58.10	54.08	-86.88	102.34	101.81	0.53	193.799				
300.00	300.00	283.78	283.77	0.55	0.33	-58.83	53.07	-87.71	102.52	101.65	0.87	118.426				
400.00	400.00	383.86	383.83	0.77	0.45	-59.85	51.63	-88.88	102.79	101.58	1.21	84.866				
500.00	500.00	485.88	485.84	0.99	0.65	-60.17	50.72	-88.47	102.00	100.36	1.64	62.202				
600.00	600.00	588.38	588.27	1.22	0.86	-58.88	51.16	-84.75	99.09	97.02	2.07	47.889				
700.00	700.00	691.50	691.05	1.44	1.09	-55.74	52.21	-76.65	93.01	90.48	2.53	36.768				
800.00	800.00	793.15	791.94	1.67	1.35	-50.04	53.96	-64.39	84.39	81.37	3.02	27.954				
900.00	900.00	894.23	891.67	1.89	1.67	-40.52	56.38	-48.19	74.56	71.03	3.53	21.114				
1,000.00	1,000.00	993.52	988.81	2.12	2.04	-25.35	58.67	-27.80	65.10	61.06	4.03	16.136				
1,084.26	1,084.26	1,075.39	1,068.26	2.31	2.40	-7.60	61.15	-8.16	61.70	57.30	4.40	14.035 CC, ES				
1,100.00	1,100.00	1,090.55	1,082.88	2.34	2.47	-3.94	61.68	-4.25	61.84	57.38	4.46	13.867 SF				
1,200.00	1,200.00	1,185.21	1,173.69	2.57	2.97	18.71	65.58	22.21	70.00	65.08	4.93	14.214				
1,300.00	1,300.00	1,278.32	1,261.96	2.79	3.52	36.00	70.71	51.38	90.14	84.54	5.60	16.098				
1,400.00	1,400.00	1,371.51	1,349.63	3.02	4.12	47.33	76.06	82.50	117.36	110.94	6.42	18.283				
1,500.00	1,500.00	1,463.53	1,435.58	3.24	4.75	55.20	80.02	115.13	148.34	141.04	7.30	20.318				
1,600.00	1,600.00	1,559.68	1,525.11	3.47	5.40	60.79	83.84	149.95	181.60	173.40	8.20	22.138				
1,700.00	1,700.00	1,657.31	1,616.98	3.69	6.01	64.74	86.33	182.93	213.09	204.02	9.06	23.509				
1,800.00	1,800.00	1,749.28	1,703.57	3.92	6.59	67.48	88.65	213.82	245.05	235.16	9.89	24.789				
1,900.00	1,900.00	1,844.03	1,792.61	4.14	7.19	69.32	92.83	245.94	278.30	267.59	10.72	25.969				
2,000.00	2,000.00	1,940.58	1,883.73	4.37	7.80	70.79	96.74	277.63	310.63	299.08	11.55	26.895				
2,100.00	2,100.00	2,033.25	1,971.15	4.59	8.40	71.98	100.23	308.16	343.14	330.76	12.37	27.728				
2,122.68	2,122.68	2,053.97	1,990.67	4.64	8.54	72.23	101.00	315.08	350.62	338.06	12.56	27.907				
2,200.00	2,199.97	2,126.14	2,058.59	4.81	9.03	147.41	103.55	339.35	377.76	367.81	9.95	37.973				
2,300.00	2,299.65	2,218.50	2,145.54	5.02	9.63	148.19	106.16	370.37	417.05	406.72	10.33	40.358				
2,400.00	2,398.68	2,306.42	2,228.35	5.25	10.19	148.98	108.69	399.81	461.27	450.60	10.67	43.237				
2,500.00	2,496.67	2,391.38	2,308.28	5.50	10.74	149.63	111.98	428.44	510.82	499.84	10.97	46.557				
2,600.00	2,593.27	2,475.72	2,387.68	5.80	11.29	150.29	115.00	456.68	564.99	553.74	11.25	50.225				
2,700.00	2,688.11	2,552.26	2,459.71	6.17	11.79	150.63	118.61	482.32	624.06	612.55	11.51	54.241				
2,800.00	2,780.84	2,631.88	2,534.65	6.64	12.31	150.92	122.97	508.84	687.61	675.85	11.76	58.446				
2,900.00	2,871.12	2,712.16	2,610.43	7.22	12.81	151.16	127.38	534.98	754.95	742.91	12.03	62.746				
3,000.00	2,958.60	2,780.06	2,674.69	7.94	13.24	150.98	131.51	556.52	825.88	813.54	12.34	66.921				
3,100.00	3,042.97	2,838.00	2,729.39	8.82	13.61	150.45	135.01	575.31	901.23	888.49	12.74	70.759				
3,200.00	3,123.90	2,892.63	2,780.88	9.85	13.97	149.71	137.87	593.33	980.58	967.31	13.27	73.906				
3,300.00	3,201.10	2,933.00	2,818.92	11.05	14.24	148.33	139.48	606.76	1,063.49	1,049.46	14.03	75.790				
3,400.00	3,274.28	2,979.85	2,862.97	12.42	14.57	146.85	141.17	622.61	1,149.74	1,134.69	15.05	76.417				
3,500.00	3,343.16	3,012.53	2,893.60	13.95	14.79	144.31	142.43	633.93	1,239.08	1,222.53	16.56	74.836				
3,600.00	3,407.49	3,042.61	2,921.74	15.64	15.00	140.91	143.63	644.52	1,331.01	1,312.35	18.66	71.315				
3,700.00	3,467.02	3,070.19	2,947.51	17.48	15.20	136.31	144.62	654.28	1,424.98	1,403.44	21.54	66.151				
3,800.00	3,521.54	3,091.91	2,967.80	19.47	15.35	129.72	145.31	661.98	1,520.61	1,495.13	25.47	59.694				
3,900.00	3,570.84	3,107.78	2,982.64	21.58	15.47	120.16	145.76	667.62	1,617.51	1,586.91	30.60	52.859				
3,979.81	3,606.32	3,116.29	2,990.59	23.35	15.53	109.64	145.98	670.64	1,695.50	1,660.23	35.27	48.073				
4,000.00	3,614.53	3,117.65	2,991.86	23.66	15.54	99.93	146.02	671.12	1,715.32	1,677.84	37.48	45.772				
4,050.00	3,632.02	3,118.18	2,992.36	24.12	15.54	73.64	146.03	671.31	1,764.46	1,726.56	37.90	46.556				
4,100.00	3,645.36	3,114.72	2,989.12	24.65	15.52	51.79	145.94	670.08	1,813.42	1,781.01	32.41	55.947				
4,150.00	3,654.45	3,107.33	2,982.21	25.25	15.46	37.48	145.75	667.45	1,861.83	1,835.58	26.25	70.925				
4,200.00	3,659.23	3,096.10	2,971.73	25.92	15.38	28.51	145.43	663.47	1,909.33	1,887.80	21.54	88.655				
4,229.81	3,660.00	3,087.64	2,963.82	26.35	15.32	24.74	145.18	660.46	1,937.08	1,917.66	19.42	99.736				
4,246.26	3,660.00	3,082.62	2,959.13	26.59	15.29	25.60	145.03	658.68	1,952.24	1,932.27	19.97	97.747				
4,300.00	3,659.99	3,066.34	2,943.91	27.43	15.17	24.97	144.49	652.92	2,001.78	1,981.83	19.95	100.365				
4,400.00	3,659.97	3,036.38	2,915.91	29.13	14.96	23.86	143.39	642.32	2,094.14	2,074.17	19.97	104.865				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 041A - Original Hole - Original Hole													Offset Site Error: 0.00 usft			
Survey Program: 375-MWD															Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft) +E/-W (usft)		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
4,500.00	3,659.95	3,011.73	2,892.86	30.98	14.79	23.00	142.40	633.65	2,186.76	2,166.57	20.20	108.276				
4,600.00	3,659.93	2,989.54	2,872.06	32.96	14.63	22.26	141.54	625.95	2,279.68	2,259.14	20.54	110.999				
4,700.00	3,659.91	2,967.87	2,851.72	35.06	14.48	21.56	140.72	618.52	2,372.87	2,351.94	20.93	113.345				
4,800.00	3,659.89	2,933.00	2,818.92	37.24	14.24	20.51	139.48	606.76	2,466.38	2,445.32	21.07	117.079				
4,900.00	3,659.86	2,933.00	2,818.92	39.50	14.24	20.51	139.48	606.76	2,560.03	2,538.02	22.01	116.286				
5,000.00	3,659.84	2,899.38	2,787.25	41.82	14.02	19.56	138.17	595.57	2,653.88	2,631.66	22.21	119.479				
5,100.00	3,659.82	2,874.88	2,764.15	44.20	13.86	18.89	137.03	587.46	2,747.89	2,725.27	22.63	121.448				
5,200.00	3,659.80	2,850.86	2,741.52	46.62	13.70	18.26	135.75	579.54	2,842.06	2,819.01	23.06	123.271				
5,300.00	3,659.78	2,838.00	2,729.39	49.08	13.61	17.93	135.01	575.31	2,936.40	2,912.66	23.74	123.699				
5,400.00	3,659.76	2,808.24	2,701.31	51.57	13.42	17.19	133.22	565.60	3,030.84	3,006.80	24.05	126.040				
5,500.00	3,659.74	2,788.29	2,682.47	54.09	13.29	16.71	132.01	559.16	3,125.47	3,100.89	24.58	127.169				
5,600.00	3,659.72	2,768.73	2,663.98	56.64	13.17	16.26	130.82	552.91	3,220.23	3,195.12	25.12	128.207				
5,700.00	3,659.70	2,743.00	2,639.62	59.20	13.00	15.69	129.24	544.76	3,315.15	3,289.62	25.53	129.868				
5,800.00	3,659.68	2,694.86	2,594.08	61.79	12.70	14.69	126.38	529.43	3,410.08	3,384.58	25.50	133.754				
5,900.00	3,659.66	2,632.34	2,535.09	64.39	12.31	13.51	123.00	509.00	3,504.71	3,479.45	25.26	138.738				
6,000.00	3,659.64	2,594.11	2,499.09	67.01	12.06	12.84	120.94	496.31	3,599.25	3,573.75	25.51	141.113				
6,100.00	3,659.61	2,555.43	2,462.69	69.64	11.81	12.20	118.79	483.38	3,693.76	3,668.00	25.76	143.387				
6,200.00	3,659.59	2,520.92	2,430.23	72.28	11.59	11.66	116.95	471.81	3,788.25	3,762.15	26.10	145.132				
6,300.00	3,659.57	2,486.47	2,397.81	74.93	11.36	11.16	115.42	460.28	3,882.75	3,856.28	26.47	146.688				
6,400.00	3,659.55	2,451.68	2,365.04	77.59	11.13	10.70	114.17	448.65	3,977.24	3,950.38	26.86	148.094				
6,500.00	3,659.53	2,416.94	2,332.32	80.26	10.91	10.25	112.95	437.02	4,071.73	4,044.47	27.26	149.380				
6,600.00	3,659.51	2,382.09	2,299.54	82.94	10.68	9.82	111.61	425.31	4,166.21	4,138.55	27.67	150.594				
6,700.00	3,659.49	2,349.12	2,268.52	85.62	10.46	9.43	110.26	414.18	4,260.70	4,232.59	28.10	151.605				
6,800.00	3,659.47	2,318.75	2,239.95	88.31	10.27	9.09	109.11	403.95	4,355.20	4,326.61	28.59	152.350				
6,900.00	3,659.45	2,288.34	2,211.32	91.00	10.07	8.76	108.11	393.75	4,449.73	4,420.65	29.08	153.011				
7,000.00	3,659.43	2,256.70	2,181.52	93.71	9.87	8.45	107.20	383.16	4,544.28	4,514.71	29.57	153.654				
7,100.00	3,659.41	2,222.15	2,148.98	96.41	9.65	8.11	106.26	371.59	4,638.84	4,608.79	30.05	154.374				
7,200.00	3,659.39	2,187.47	2,116.32	99.12	9.43	7.79	105.31	359.96	4,733.38	4,702.85	30.53	155.029				
7,300.00	3,659.36	2,155.42	2,086.15	101.83	9.22	7.51	104.43	349.19	4,827.93	4,796.88	31.05	155.502				
7,400.00	3,659.34	2,125.93	2,058.39	104.55	9.03	7.25	103.54	339.28	4,922.49	4,890.90	31.59	155.832				
7,500.00	3,659.32	2,096.57	2,030.75	107.27	8.83	7.00	102.56	329.40	5,017.09	4,984.95	32.13	156.132				
7,600.00	3,659.30	2,076.00	2,011.40	109.99	8.69	6.83	101.82	322.47	5,111.71	5,078.96	32.75	156.070				
7,700.00	3,659.28	2,048.43	1,985.45	112.72	8.51	6.60	100.79	313.22	5,206.39	5,173.07	33.32	156.261				
7,800.00	3,659.26	2,027.46	1,965.69	115.45	8.36	6.44	100.01	306.23	5,301.14	5,267.20	33.94	156.196				
7,900.00	3,659.24	2,006.72	1,946.15	118.18	8.22	6.28	99.24	299.36	5,395.96	5,361.40	34.56	156.119				
8,000.00	3,659.22	1,982.00	1,922.82	120.92	8.06	6.09	98.31	291.22	5,490.85	5,455.69	35.16	156.168				
8,100.00	3,659.20	1,960.96	1,902.97	123.65	7.93	5.94	97.52	284.31	5,585.79	5,550.01	35.79	156.092				
8,200.00	3,659.18	1,934.53	1,878.01	126.39	7.76	5.75	96.50	275.65	5,680.77	5,644.39	36.37	156.172				
8,300.00	3,659.16	1,908.22	1,853.17	129.13	7.59	5.56	95.47	267.04	5,775.78	5,738.81	36.97	156.234				
8,400.00	3,659.14	1,837.01	1,786.01	131.87	7.15	5.08	92.52	243.59	5,870.79	5,833.50	37.29	157.430				
8,500.00	3,659.11	1,767.54	1,720.73	134.62	6.70	4.63	89.35	220.02	5,965.42	5,927.76	37.66	158.395				
8,600.00	3,659.09	1,738.23	1,693.18	137.36	6.51	4.46	88.28	210.08	6,060.05	6,021.78	38.27	158.338				
8,700.00	3,659.07	1,708.89	1,665.56	140.11	6.32	4.29	87.44	200.20	6,154.71	6,115.81	38.89	158.247				
8,800.00	3,659.05	1,679.53	1,637.91	142.86	6.14	4.14	86.81	190.36	6,249.37	6,209.86	39.52	158.139				
8,900.00	3,659.03	1,650.23	1,610.31	145.61	5.96	3.99	86.17	180.56	6,344.06	6,303.92	40.15	158.028				
9,000.00	3,659.01	1,462.63	1,434.74	148.36	4.74	3.06	79.99	114.81	6,438.02	6,397.82	40.20	160.130				
9,050.32	3,659.00	1,454.18	1,426.86	149.74	4.68	3.02	79.63	111.75	6,485.29	6,444.74	40.55	159.923				



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 254A - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 166-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
0.00	0.00	0.00	0.00	0.00	0.00	16.21	284.49	82.70	296.28						
100.00	100.00	97.78	97.78	0.10	0.71	16.22	284.32	82.70	296.10	295.29	0.81	366.994			
200.00	200.00	199.08	199.08	0.32	1.88	16.22	284.36	82.70	296.14	293.94	2.20	134.502			
300.00	300.00	298.59	298.58	0.55	3.91	16.23	284.07	82.70	295.86	291.41	4.45	66.424			
400.00	400.00	398.09	398.08	0.77	5.94	16.24	283.96	82.70	295.75	289.05	6.71	44.100			
415.00	415.00	413.02	413.01	0.80	6.24	16.24	283.95	82.70	295.75	288.71	7.04	41.984 CC			
500.00	500.00	497.58	497.58	0.99	7.96	16.23	284.02	82.70	295.81	286.85	8.96	33.020			
600.00	600.00	597.07	597.06	1.22	9.99	16.22	284.25	82.70	296.04	284.83	11.21	26.407			
700.00	700.00	698.01	698.00	1.44	12.28	16.21	284.49	82.70	296.27	282.55	13.72	21.589			
800.00	800.00	798.01	798.00	1.67	14.92	16.21	284.49	82.70	296.27	279.68	16.59	17.854			
900.00	900.00	898.02	898.00	1.89	17.57	16.21	284.49	82.70	296.27	276.81	19.46	15.221			
1,000.00	1,000.00	998.02	998.00	2.12	20.22	16.21	284.49	82.70	296.27	273.94	22.33	13.265			
1,100.00	1,100.00	1,098.03	1,098.00	2.34	22.86	16.21	284.49	82.70	296.27	271.06	25.20	11.755			
1,200.00	1,200.00	1,198.03	1,198.00	2.57	25.51	16.21	284.49	82.70	296.27	268.19	28.08	10.553			
1,300.00	1,300.00	1,298.04	1,298.00	2.79	28.15	16.21	284.49	82.70	296.27	265.32	30.95	9.574			
1,400.00	1,400.00	1,398.04	1,398.00	3.02	30.80	16.21	284.49	82.70	296.27	262.45	33.82	8.760			
1,500.00	1,500.00	1,498.05	1,498.00	3.24	33.45	16.21	284.49	82.70	296.27	259.57	36.69	8.074			
1,600.00	1,600.00	1,598.05	1,598.00	3.47	36.10	16.21	284.49	82.70	296.27	256.70	39.57	7.487			
1,700.00	1,700.00	1,698.06	1,698.00	3.69	38.75	16.21	284.49	82.70	296.27	253.83	42.44	6.980			
1,800.00	1,800.00	1,798.06	1,798.00	3.92	41.40	16.21	284.49	82.70	296.27	250.95	45.32	6.538			
1,900.00	1,900.00	1,898.07	1,898.00	4.14	44.05	16.21	284.49	82.70	296.27	248.08	48.19	6.148			
2,000.00	2,000.00	1,998.07	1,998.00	4.37	46.70	16.21	284.49	82.70	296.27	245.20	51.07	5.802			
2,100.00	2,100.00	2,098.08	2,098.00	4.59	49.35	16.21	284.49	82.70	296.27	242.33	53.94	5.492			
2,122.68	2,122.68	2,120.76	2,120.68	4.64	49.95	16.21	284.49	82.70	296.27	241.67	54.59	5.427			
2,200.00	2,199.97	2,198.06	2,197.97	4.81	52.00	91.32	284.49	82.70	296.31	239.50	56.81	5.216			
2,300.00	2,299.65	2,297.74	2,297.65	5.02	54.64	92.81	284.49	82.70	296.59	236.93	59.66	4.971			
2,400.00	2,398.68	2,396.77	2,396.68	5.25	57.27	95.41	284.49	82.70	297.59	235.09	62.50	4.761			
2,500.00	2,496.67	2,494.77	2,494.67	5.50	59.86	99.02	284.49	82.70	300.14	234.82	65.32	4.595 ES			
2,600.00	2,593.27	2,591.37	2,591.27	5.80	62.42	103.47	284.49	82.70	305.36	237.29	68.06	4.486			
2,700.00	2,688.11	2,686.22	2,686.11	6.17	64.94	108.52	284.49	82.70	314.54	243.89	70.65	4.452 SF			
2,800.00	2,780.84	2,778.95	2,778.84	6.64	67.40	113.87	284.49	82.70	329.00	256.02	72.98	4.508			
2,900.00	2,871.12	2,869.24	2,869.12	7.22	69.79	119.20	284.49	82.70	349.84	274.92	74.92	4.669			
3,000.00	2,958.60	2,956.73	2,956.60	7.94	72.11	124.24	284.49	82.70	377.83	301.42	76.41	4.945			
3,100.00	3,042.97	3,041.10	3,040.97	8.82	74.34	128.82	284.49	82.70	413.28	335.89	77.39	5.340			
3,200.00	3,123.90	3,122.03	3,121.90	9.85	76.49	132.81	284.49	82.70	456.16	378.27	77.89	5.856			
3,300.00	3,201.10	3,199.24	3,199.10	11.05	78.53	136.19	284.49	82.70	506.16	428.20	77.96	6.492			
3,400.00	3,274.28	3,272.42	3,272.28	12.42	80.47	138.95	284.49	82.70	562.83	485.14	77.68	7.245			
3,500.00	3,343.16	3,341.30	3,341.16	13.95	82.30	141.11	284.49	82.70	625.61	548.45	77.16	8.108			
3,600.00	3,407.49	3,405.63	3,405.49	15.64	84.01	142.70	284.49	82.70	693.98	617.47	76.51	9.071			
3,700.00	3,467.02	3,465.17	3,465.02	17.48	85.58	143.75	284.49	82.70	767.39	691.50	75.89	10.112			
3,800.00	3,521.54	3,519.69	3,519.54	19.47	87.03	144.23	284.49	82.70	845.32	769.83	75.49	11.198			
3,900.00	3,570.84	3,568.99	3,568.84	21.58	88.34	144.13	284.49	82.70	927.29	851.71	75.58	12.268			
3,979.81	3,606.32	3,604.48	3,604.32	23.35	89.28	143.58	284.49	82.70	995.29	919.06	76.24	13.055			
4,000.00	3,614.53	3,612.68	3,612.53	23.66	89.49	141.93	284.49	82.70	1,012.91	935.52	77.39	13.088			
4,050.00	3,632.02	3,630.17	3,630.02	24.12	89.96	136.62	284.49	82.70	1,057.78	975.48	82.30	12.853			
4,100.00	3,645.36	3,643.52	3,643.36	24.65	90.31	128.90	284.49	82.70	1,104.11	1,013.09	91.01	12.131			
4,150.00	3,654.45	3,652.61	3,652.45	25.25	90.55	117.55	284.49	82.70	1,151.53	1,048.52	103.02	11.178			
4,200.00	3,659.23	3,657.39	3,657.23	25.92	90.68	101.54	284.49	82.70	1,199.68	1,085.43	114.25	10.500			
4,229.81	3,660.00	3,658.16	3,658.00	26.35	90.70	90.00	284.49	82.70	1,228.58	1,111.53	117.05	10.496			
4,246.26	3,660.00	3,658.16	3,658.00	26.59	90.70	89.95	284.49	82.70	1,244.54	1,127.25	117.29	10.611			
4,300.00	3,659.99	3,658.15	3,657.99	27.43	90.70	89.95	284.49	82.70	1,296.69	1,178.56	118.13	10.977			
4,400.00	3,659.97	3,658.13	3,657.97	29.13	90.70	89.95	284.49	82.70	1,394.05	1,274.23	119.82	11.634			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 254A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 166-INC_ONLY<10													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,500.00	3,659.95	3,658.11	3,657.95	30.98	90.70	89.94	284.49	82.70	1,491.77	1,370.10	121.67	12.260		
4,600.00	3,659.93	3,658.09	3,657.93	32.96	90.70	89.94	284.49	82.70	1,589.77	1,466.11	123.66	12.856		
4,700.00	3,659.91	3,658.06	3,657.91	35.06	90.70	89.94	284.49	82.70	1,688.01	1,562.26	125.75	13.423		
4,800.00	3,659.89	3,658.04	3,657.89	37.24	90.70	89.93	284.49	82.70	1,786.44	1,658.50	127.94	13.964		
4,900.00	3,659.86	3,658.02	3,657.86	39.50	90.69	89.93	284.49	82.70	1,885.03	1,754.84	130.19	14.479		
5,000.00	3,659.84	3,658.00	3,657.84	41.82	90.69	89.92	284.49	82.70	1,983.77	1,851.25	132.52	14.970		
5,100.00	3,659.82	3,657.98	3,657.82	44.20	90.69	89.92	284.49	82.70	2,082.63	1,947.74	134.89	15.439		
5,200.00	3,659.80	3,657.96	3,657.80	46.62	90.69	89.92	284.49	82.70	2,181.59	2,044.28	137.31	15.888		
5,300.00	3,659.78	3,657.94	3,657.78	49.08	90.69	89.91	284.49	82.70	2,280.64	2,140.87	139.77	16.317		
5,400.00	3,659.76	3,657.92	3,657.76	51.57	90.69	89.91	284.49	82.70	2,379.77	2,237.51	142.26	16.728		
5,500.00	3,659.74	3,657.90	3,657.74	54.09	90.69	89.90	284.49	82.70	2,478.97	2,334.19	144.78	17.122		
5,600.00	3,659.72	3,657.88	3,657.72	56.64	90.69	89.90	284.49	82.70	2,578.24	2,430.91	147.33	17.500		
5,700.00	3,659.70	3,657.86	3,657.70	59.20	90.69	89.90	284.49	82.70	2,677.55	2,527.66	149.89	17.863		
5,800.00	3,659.68	3,657.84	3,657.68	61.79	90.69	89.89	284.49	82.70	2,776.92	2,624.44	152.48	18.212		
5,900.00	3,659.66	3,657.81	3,657.66	64.39	90.69	89.89	284.49	82.70	2,876.33	2,721.25	155.08	18.547		
6,000.00	3,659.64	3,657.79	3,657.64	67.01	90.69	89.88	284.49	82.70	2,975.78	2,818.08	157.70	18.870		
6,100.00	3,659.61	3,657.77	3,657.61	69.64	90.69	89.88	284.49	82.70	3,075.27	2,914.94	160.33	19.181		
6,200.00	3,659.59	3,657.75	3,657.59	72.28	90.69	89.88	284.49	82.70	3,174.78	3,011.82	162.97	19.481		
6,300.00	3,659.57	3,657.73	3,657.57	74.93	90.69	89.87	284.49	82.70	3,274.33	3,108.71	165.62	19.770		
6,400.00	3,659.55	3,657.71	3,657.55	77.59	90.69	89.87	284.49	82.70	3,373.91	3,205.63	168.28	20.050		
6,500.00	3,659.53	3,657.69	3,657.53	80.26	90.69	89.87	284.49	82.70	3,473.50	3,302.56	170.95	20.319		
6,600.00	3,659.51	3,657.67	3,657.51	82.94	90.69	89.86	284.49	82.70	3,573.13	3,399.50	173.62	20.580		
6,700.00	3,659.49	3,657.65	3,657.49	85.62	90.68	89.86	284.49	82.70	3,672.77	3,496.46	176.30	20.832		
6,800.00	3,659.47	3,657.63	3,657.47	88.31	90.68	89.85	284.49	82.70	3,772.43	3,593.43	178.99	21.076		
6,900.00	3,659.45	3,657.61	3,657.45	91.00	90.68	89.85	284.49	82.70	3,872.11	3,690.42	181.69	21.312		
7,000.00	3,659.43	3,657.59	3,657.43	93.71	90.68	89.85	284.49	82.70	3,971.80	3,787.41	184.39	21.540		
7,100.00	3,659.41	3,657.56	3,657.41	96.41	90.68	89.84	284.49	82.70	4,071.51	3,884.42	187.09	21.762		
7,200.00	3,659.39	3,657.54	3,657.39	99.12	90.68	89.84	284.49	82.70	4,171.23	3,981.43	189.80	21.977		
7,300.00	3,659.36	3,657.52	3,657.36	101.83	90.68	89.83	284.49	82.70	4,270.97	4,078.45	192.51	22.185		
7,400.00	3,659.34	3,657.50	3,657.34	104.55	90.68	89.83	284.49	82.70	4,370.72	4,175.49	195.23	22.387		
7,500.00	3,659.32	3,657.48	3,657.32	107.27	90.68	89.83	284.49	82.70	4,470.48	4,272.53	197.95	22.584		
7,600.00	3,659.30	3,657.46	3,657.30	109.99	90.68	89.82	284.49	82.70	4,570.25	4,369.57	200.67	22.775		
7,700.00	3,659.28	3,657.44	3,657.28	112.72	90.68	89.82	284.49	82.70	4,670.03	4,466.63	203.40	22.960		
7,800.00	3,659.26	3,657.42	3,657.26	115.45	90.68	89.81	284.49	82.70	4,769.82	4,563.69	206.13	23.140		
7,900.00	3,659.24	3,657.40	3,657.24	118.18	90.68	89.81	284.49	82.70	4,869.61	4,660.75	208.86	23.315		
8,000.00	3,659.22	3,657.38	3,657.22	120.92	90.68	89.81	284.49	82.70	4,969.42	4,757.83	211.59	23.486		
8,100.00	3,659.20	3,657.36	3,657.20	123.65	90.68	89.80	284.49	82.70	5,069.23	4,854.90	214.33	23.652		
8,200.00	3,659.18	3,657.34	3,657.18	126.39	90.68	89.80	284.49	82.70	5,169.05	4,951.99	217.07	23.813		
8,300.00	3,659.16	3,657.31	3,657.16	129.13	90.68	89.80	284.49	82.70	5,268.88	5,049.07	219.81	23.971		
8,400.00	3,659.14	3,657.29	3,657.14	131.87	90.68	89.79	284.49	82.70	5,368.71	5,146.17	222.55	24.124		
8,500.00	3,659.11	3,657.27	3,657.11	134.62	90.67	89.79	284.49	82.70	5,468.55	5,243.26	225.29	24.273		
8,600.00	3,659.09	3,657.25	3,657.09	137.36	90.67	89.78	284.49	82.70	5,568.40	5,340.36	228.04	24.419		
8,700.00	3,659.07	3,657.23	3,657.07	140.11	90.67	89.78	284.49	82.70	5,668.25	5,437.47	230.78	24.561		
8,800.00	3,659.05	3,657.21	3,657.05	142.86	90.67	89.78	284.49	82.70	5,768.11	5,534.58	233.53	24.700		
8,900.00	3,659.03	3,657.19	3,657.03	145.61	90.67	89.77	284.49	82.70	5,867.97	5,631.69	236.28	24.835		
9,000.00	3,659.01	3,657.17	3,657.01	148.36	90.67	89.77	284.49	82.70	5,967.83	5,728.81	239.03	24.967		
9,050.32	3,659.00	3,657.16	3,657.00	149.74	90.67	89.77	284.49	82.70	6,018.09	5,777.67	240.41	25.032		



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 254H - Pilot Hole - Rev0													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
3,979.81	3,606.32	3,979.81	3,606.32	0.00	0.00	0.00	248.45	-911.94	0.00	0.00	0.00	0.000	Level 1, CC, SF
3,987.68	3,609.60	3,987.68	3,609.65	0.17	0.18	179.98	250.33	-918.82	0.05	-0.08	0.14	0.396	Level 1, ES
4,000.00	3,614.53	4,000.00	3,614.85	0.43	0.46	179.98	253.26	-929.59	0.36	0.01	0.34	1.041	Level 2
4,050.00	3,632.02	4,049.82	3,635.91	0.77	1.60	179.98	265.13	-973.16	4.29	3.66	0.63	6.770	
4,100.00	3,645.36	4,099.12	3,656.74	1.30	2.73	179.98	276.88	-1,016.27	12.56	11.65	0.91	13.813	
4,150.00	3,654.45	4,147.51	3,677.19	1.90	3.85	179.98	288.40	-1,058.58	25.09	23.94	1.15	21.802	
4,200.00	3,659.23	4,194.62	3,697.10	2.57	4.94	179.98	299.63	-1,099.78	41.79	40.46	1.33	31.400	
4,229.81	3,660.00	4,221.96	3,708.65	3.00	5.57	179.98	306.14	-1,123.68	53.68	52.34	1.34	39.980	
4,246.26	3,660.00	4,236.86	3,714.95	3.25	5.92	179.83	309.69	-1,136.71	60.64	59.19	1.44	42.051	
4,300.00	3,659.99	4,285.56	3,735.53	4.09	7.06	-179.84	321.29	-1,179.30	83.36	81.50	1.86	44.845	
4,400.00	3,659.97	4,376.18	3,773.83	5.79	9.18	-179.54	342.88	-1,258.54	125.64	122.93	2.71	46.420	
4,500.00	3,659.95	4,466.80	3,812.13	7.65	11.30	-179.40	364.47	-1,337.78	167.93	164.30	3.63	46.294	
4,600.00	3,659.93	4,546.94	3,846.00	9.64	13.19	-179.32	383.56	-1,407.86	210.48	205.93	4.55	46.294	
4,700.00	3,659.91	4,546.94	3,846.00	11.74	13.19	-179.32	383.56	-1,407.86	271.99	266.94	5.04	53.948	
4,800.00	3,659.89	4,546.94	3,846.00	13.92	13.19	-179.32	383.56	-1,407.86	351.64	346.07	5.57	63.080	
4,900.00	3,659.86	4,546.94	3,846.00	16.19	13.19	-179.32	383.56	-1,407.86	439.69	433.55	6.14	71.635	
5,000.00	3,659.84	4,546.94	3,846.00	18.51	13.19	-179.32	383.56	-1,407.86	531.98	525.26	6.73	79.092	
5,100.00	3,659.82	4,546.94	3,846.00	20.89	13.19	-179.32	383.56	-1,407.86	626.64	619.31	7.33	85.438	
5,200.00	3,659.80	4,546.94	3,846.00	23.31	13.19	-179.32	383.56	-1,407.86	722.74	714.79	7.96	90.804	
5,300.00	3,659.78	4,546.94	3,846.00	25.77	13.19	-179.32	383.56	-1,407.86	819.78	811.18	8.60	95.344	
5,400.00	3,659.76	4,546.94	3,846.00	28.27	13.19	-179.32	383.56	-1,407.86	917.45	908.20	9.25	99.204	
5,500.00	3,659.74	4,546.94	3,846.00	30.79	13.19	-179.32	383.56	-1,407.86	1,015.57	1,005.67	9.91	102.503	
5,600.00	3,659.72	4,546.94	3,846.00	33.34	13.19	-179.32	383.56	-1,407.86	1,114.03	1,103.46	10.58	105.340	
5,700.00	3,659.70	4,546.94	3,846.00	35.90	13.19	-179.32	383.56	-1,407.86	1,212.74	1,201.49	11.25	107.797	
5,800.00	3,659.68	4,546.94	3,846.00	38.49	13.19	-179.32	383.56	-1,407.86	1,311.65	1,299.72	11.93	109.938	
5,900.00	3,659.66	4,546.94	3,846.00	41.09	13.19	-179.32	383.56	-1,407.86	1,410.71	1,398.09	12.62	111.814	
6,000.00	3,659.64	4,546.94	3,846.00	43.71	13.19	-179.32	383.56	-1,407.86	1,509.89	1,496.59	13.31	113.469	
6,100.00	3,659.61	4,546.94	3,846.00	46.34	13.19	-179.32	383.56	-1,407.86	1,609.18	1,595.18	14.00	114.936	
6,200.00	3,659.59	4,546.94	3,846.00	48.98	13.19	-179.32	383.56	-1,407.86	1,708.55	1,693.85	14.70	116.243	
6,300.00	3,659.57	4,546.94	3,846.00	51.63	13.19	-179.32	383.56	-1,407.86	1,807.98	1,792.58	15.40	117.414	
6,400.00	3,659.55	4,546.94	3,846.00	54.29	13.19	-179.32	383.56	-1,407.86	1,907.48	1,891.38	16.10	118.466	
6,500.00	3,659.53	4,546.94	3,846.00	56.96	13.19	-179.32	383.56	-1,407.86	2,007.03	1,990.22	16.81	119.417	
6,600.00	3,659.51	4,546.94	3,846.00	59.64	13.19	-179.32	383.56	-1,407.86	2,106.62	2,089.10	17.51	120.280	
6,700.00	3,659.49	4,546.94	3,846.00	62.32	13.19	-179.32	383.56	-1,407.86	2,206.24	2,188.02	18.22	121.065	
6,800.00	3,659.47	4,546.94	3,846.00	65.01	13.19	-179.32	383.56	-1,407.86	2,305.90	2,286.97	18.93	121.781	
6,900.00	3,659.45	4,546.94	3,846.00	67.71	13.19	-179.32	383.56	-1,407.86	2,405.59	2,385.94	19.65	122.438	
7,000.00	3,659.43	4,546.94	3,846.00	70.41	13.19	-179.32	383.56	-1,407.86	2,505.30	2,484.94	20.36	123.042	
7,100.00	3,659.41	4,546.94	3,846.00	73.11	13.19	-179.32	383.56	-1,407.86	2,605.04	2,583.96	21.08	123.598	
7,200.00	3,659.39	4,546.94	3,846.00	75.82	13.19	-179.32	383.56	-1,407.86	2,704.79	2,683.00	21.79	124.113	
7,300.00	3,659.36	4,546.94	3,846.00	78.54	13.19	-179.32	383.56	-1,407.86	2,804.56	2,782.05	22.51	124.589	
7,400.00	3,659.34	4,546.94	3,846.00	81.25	13.19	-179.32	383.56	-1,407.86	2,904.35	2,881.12	23.23	125.032	
7,500.00	3,659.32	4,546.94	3,846.00	83.97	13.19	-179.32	383.56	-1,407.86	3,004.15	2,980.20	23.95	125.444	
7,600.00	3,659.30	4,546.94	3,846.00	86.70	13.19	-179.32	383.56	-1,407.86	3,103.97	3,079.30	24.67	125.828	
7,700.00	3,659.28	4,546.94	3,846.00	89.42	13.19	-179.32	383.56	-1,407.86	3,203.79	3,178.40	25.39	126.188	
7,800.00	3,659.26	4,546.94	3,846.00	92.15	13.19	-179.32	383.56	-1,407.86	3,303.63	3,277.52	26.11	126.524	
7,900.00	3,659.24	4,546.94	3,846.00	94.88	13.19	-179.32	383.56	-1,407.86	3,403.47	3,376.64	26.83	126.840	
8,000.00	3,659.22	4,546.94	3,846.00	97.62	13.19	-179.32	383.56	-1,407.86	3,503.33	3,475.77	27.56	127.137	
8,100.00	3,659.20	4,546.94	3,846.00	100.35	13.19	-179.32	383.56	-1,407.86	3,603.19	3,574.91	28.28	127.416	
8,200.00	3,659.18	4,546.94	3,846.00	103.09	13.19	-179.32	383.56	-1,407.86	3,703.06	3,674.06	29.00	127.680	
8,300.00	3,659.16	4,546.94	3,846.00	105.83	13.19	-179.32	383.56	-1,407.86	3,802.94	3,773.21	29.73	127.929	
8,400.00	3,659.14	4,546.94	3,846.00	108.57	13.19	-179.32	383.56	-1,407.86	3,902.82	3,872.37	30.45	128.164	
8,500.00	3,659.11	4,546.94	3,846.00	111.32	13.19	-179.32	383.56	-1,407.86	4,002.71	3,971.53	31.18	128.387	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 254H - Pilot Hole - Rev0													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,600.00	3,659.09	4,546.94	3,846.00	114.06	13.19	-179.32	383.56	-1,407.86	4,102.60	4,070.70	31.90	128.598		
8,700.00	3,659.07	4,546.94	3,846.00	116.81	13.19	-179.32	383.56	-1,407.86	4,202.50	4,169.88	32.63	128.799		
8,800.00	3,659.05	4,546.94	3,846.00	119.56	13.19	-179.32	383.56	-1,407.86	4,302.41	4,269.05	33.35	128.990		
8,900.00	3,659.03	4,546.94	3,846.00	122.31	13.19	-179.32	383.56	-1,407.86	4,402.32	4,368.24	34.08	129.171		
9,000.00	3,659.01	4,546.94	3,846.00	125.06	13.19	-179.32	383.56	-1,407.86	4,502.23	4,467.42	34.81	129.344		
9,050.32	3,659.00	4,546.94	3,846.00	126.44	13.19	-179.32	383.56	-1,407.86	4,552.50	4,517.33	35.17	129.428		



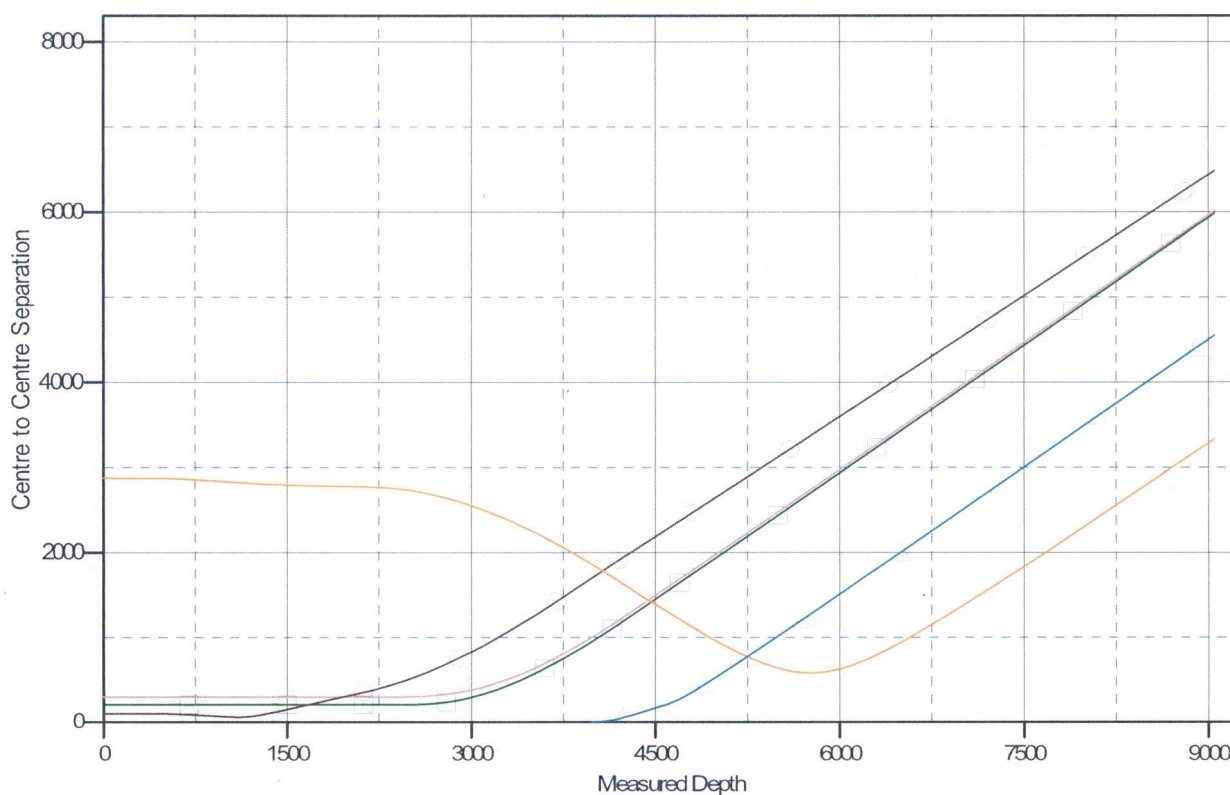
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6977.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: San Juan 32-8 Unit 254H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.11°

Ladder Plot



LEGEND

San Juan 32-8 Unit 254A, Original Hole, Original Hole V0
San Juan 32-8 Unit 041, Original Hole, Original Hole V0
San Juan 32-8 Unit 041A, Original Hole, Original Hole V0
San Juan 32-8 Unit 259, Original Hole, Original Hole V0
San Juan 32-8 Unit 254H, Pilot Hole, Rev0



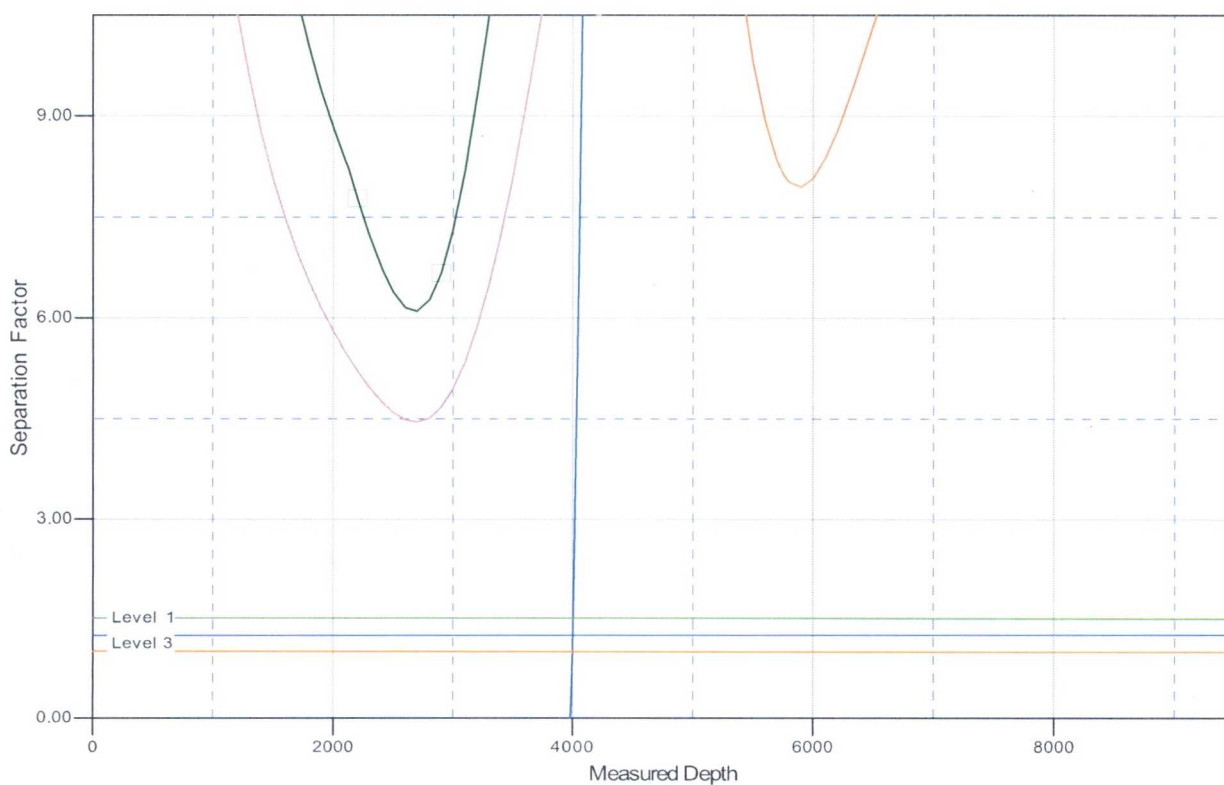
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Lat 1
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6977.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: San Juan 32-8 Unit 254H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.11°

Separation Factor Plot



LEGEND

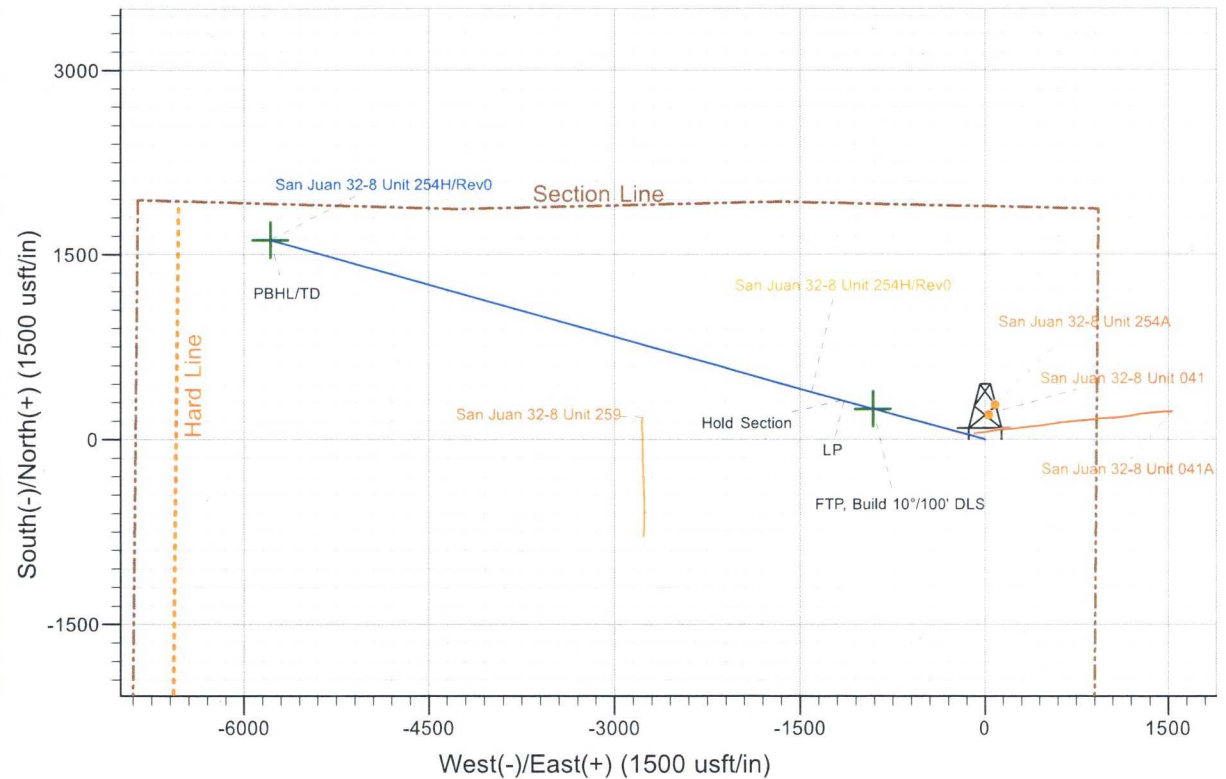
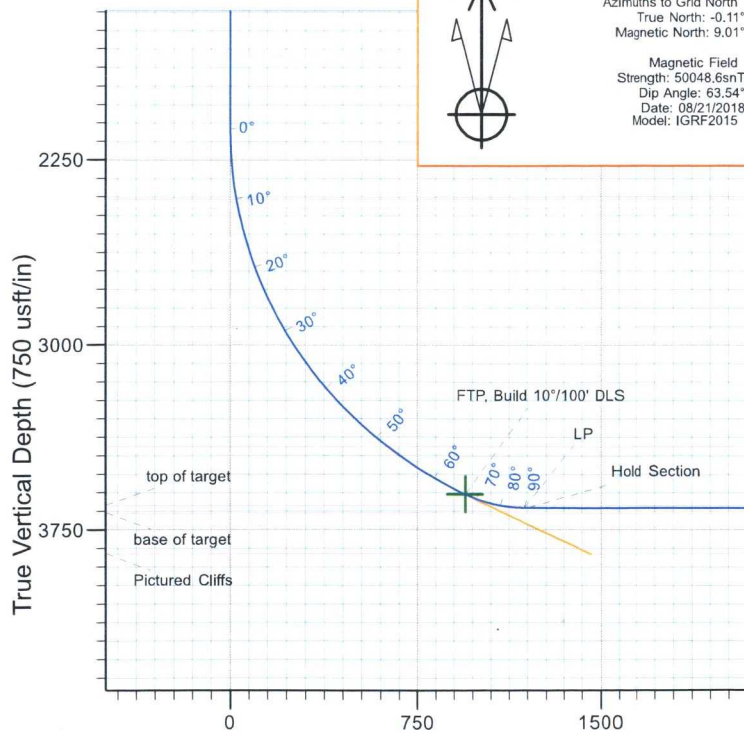
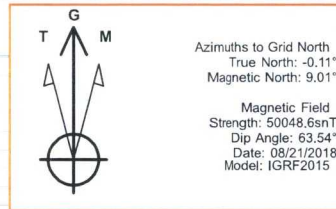
San Juan 32-8 Unit 254A, Original Hole, Original Hole V0
San Juan 32-8 Unit 041, Original Hole, Original Hole V0
San Juan 32-8 Unit 041A, Original Hole, Original Hole V0
San Juan 32-8 Unit 259, Original Hole, Original Hole V0
San Juan 32-8 Unit 254H, Pilot Hole, Rev0



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.23-T32N-R08W
 Well: San Juan 32-8 Unit 254H
 Borehole: Lat 1
 Plan: Rev0



WELL DETAILS: San Juan 32-8 Unit 254H									
		GL 6962.00		KB @ 6977.00usft					
+N/-S 0.00	+E/-W 0.00	Northing 2172826.46	Easting 554305.66	Latitude 36.97117°N	Longitude 107.64743°W				
SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	3979.81	65.00	285.24	3606.32	248.45	-911.94	0.00	0.00	945.15
2	4229.81	90.00	285.23	3660.00	312.08	-1145.57	10.00	-0.02	1187.29
3	4246.35	90.01	285.73	3660.00	316.49	-1161.51	3.00	88.62	1203.83
4	9050.32	90.01	285.73	3659.00	1618.54	-5785.66	0.00	0.00	6007.79
DESIGN TARGET DETAILS									
Name		TVD	+N/-S	+E/-W	Latitude		Longitude		
SJ 32-8 Unit 254H FTP		3606.32	248.45	-911.94	36.97186°N		107.65056°W		
SJ 32-8 Unit 254H Toe		3659.00	1618.54	-5785.66	36.97564°N		107.66723°W		
FORMATION TOP DETAILS					ANNOTATIONS				
TVDPath	MDPath	Formation			TVD	MD	Annotation		
2409.00	2410.48	Ojo Alamo			3606.32	3979.81	FTP, Build 10°/100' DLS		
2444.00	2446.10	Kirtland			3660.00	4229.81	LP		
3412.00	3607.31	Fruitland			3660.00	4246.35	Hold Section		
3650.00	4122.60	top of target			3659.00	9050.32	PBHL/TD		



San Juan 32-8 Unit 254H Rev0
 Created By: J Rieke Date: 16:47, August 29 2018



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.23-T32N-R08W

San Juan 32-8 Unit 254H

Lat 1

Plan: Rev0

Standard Planning Report - Geographic

29 August, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.23-T32N-R08W
Well: San Juan 32-8 Unit 254H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	San Juan Co., NM (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site	Sec.23-T32N-R08W		
Site Position:		Northing:	2,172,826.46 usft
From:	Map	Easting:	554,305.66 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	36.97117°N
		Longitude:	107.64744°W
		Grid Convergence:	0.11 °

Well	San Juan 32-8 Unit 254H		
Well Position	+N/-S	0.00 usft	Northing: 2,172,826.46 usft
	+E/-W	0.00 usft	Easting: 554,305.66 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36.97117°N
		Longitude:	107.64744°W
		Ground Level:	6,962.00 usft

Wellbore	Lat 1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	08/21/18	9.12	63.54	50,049

Design	Rev0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	3,979.81
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	285.63

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
3,979.81	65.00	285.24	3,606.32	248.45	-911.94	0.00	0.00	0.00	0.00	
4,229.81	90.00	285.23	3,660.00	312.08	-1,145.57	10.00	10.00	0.00	-0.02	
4,246.35	90.01	285.73	3,660.00	316.49	-1,161.51	3.00	0.07	3.00	88.62	
9,050.32	90.01	285.73	3,659.00	1,618.54	-5,785.66	0.00	0.00	0.00	0.00	SJ 32-8 Unit 254H To



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.23-T32N-R08W
Well: San Juan 32-8 Unit 254H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,979.81	65.00	285.24	3,606.32	248.45	-911.94	2,173,074.91	553,393.73	36.97186°N	107.65056°W
FTP, Build 10°/100' DLS									
4,000.00	67.02	285.24	3,614.53	253.30	-929.73	2,173,079.76	553,375.93	36.97187°N	107.65062°W
4,100.00	77.02	285.23	3,645.36	278.27	-1,021.39	2,173,104.72	553,284.27	36.97194°N	107.65093°W
4,200.00	87.02	285.23	3,659.23	304.25	-1,116.82	2,173,130.71	553,188.84	36.97201°N	107.65126°W
4,229.81	90.00	285.23	3,660.00	312.08	-1,145.57	2,173,138.54	553,160.09	36.97203°N	107.65136°W
LP									
4,246.35	90.01	285.73	3,660.00	316.49	-1,161.51	2,173,142.95	553,144.15	36.97205°N	107.65141°W
Hold Section									
4,300.00	90.01	285.73	3,659.99	331.04	-1,213.15	2,173,157.49	553,092.51	36.97209°N	107.65159°W
4,400.00	90.01	285.73	3,659.97	358.14	-1,309.41	2,173,184.59	552,996.25	36.97216°N	107.65192°W
4,500.00	90.01	285.73	3,659.95	385.24	-1,405.67	2,173,211.70	552,900.00	36.97224°N	107.65225°W
4,600.00	90.01	285.73	3,659.93	412.35	-1,501.92	2,173,238.80	552,803.74	36.97231°N	107.65258°W
4,700.00	90.01	285.73	3,659.91	439.45	-1,598.18	2,173,265.91	552,707.48	36.97239°N	107.65291°W
4,800.00	90.01	285.73	3,659.89	466.55	-1,694.44	2,173,293.01	552,611.23	36.97246°N	107.65324°W
4,900.00	90.01	285.73	3,659.86	493.66	-1,790.69	2,173,320.11	552,514.97	36.97254°N	107.65356°W
5,000.00	90.01	285.73	3,659.84	520.76	-1,886.95	2,173,347.22	552,418.71	36.97261°N	107.65389°W
5,100.00	90.01	285.73	3,659.82	547.86	-1,983.21	2,173,374.32	552,322.46	36.97269°N	107.65422°W
5,200.00	90.01	285.73	3,659.80	574.97	-2,079.46	2,173,401.42	552,226.20	36.97276°N	107.65455°W
5,300.00	90.01	285.73	3,659.78	602.07	-2,175.72	2,173,428.53	552,129.94	36.97284°N	107.65488°W
5,400.00	90.01	285.73	3,659.76	629.18	-2,271.98	2,173,455.63	552,033.68	36.97291°N	107.65521°W
5,500.00	90.01	285.73	3,659.74	656.28	-2,368.24	2,173,482.73	551,937.43	36.97299°N	107.65554°W
5,600.00	90.01	285.73	3,659.72	683.38	-2,464.49	2,173,509.84	551,841.17	36.97306°N	107.65587°W
5,700.00	90.01	285.73	3,659.70	710.49	-2,560.75	2,173,536.94	551,744.91	36.97313°N	107.65620°W
5,800.00	90.01	285.73	3,659.68	737.59	-2,657.01	2,173,564.05	551,648.66	36.97321°N	107.65653°W
5,900.00	90.01	285.73	3,659.66	764.69	-2,753.26	2,173,591.15	551,552.40	36.97328°N	107.65686°W
6,000.00	90.01	285.73	3,659.64	791.80	-2,849.52	2,173,618.25	551,456.14	36.97336°N	107.65719°W
6,100.00	90.01	285.73	3,659.61	818.90	-2,945.78	2,173,645.36	551,359.89	36.97343°N	107.65752°W
6,200.00	90.01	285.73	3,659.59	846.00	-3,042.03	2,173,672.46	551,263.63	36.97351°N	107.65785°W
6,300.00	90.01	285.73	3,659.57	873.11	-3,138.29	2,173,699.56	551,167.37	36.97358°N	107.65818°W
6,400.00	90.01	285.73	3,659.55	900.21	-3,234.55	2,173,726.67	551,071.12	36.97366°N	107.65850°W
6,500.00	90.01	285.73	3,659.53	927.32	-3,330.80	2,173,753.77	550,974.86	36.97373°N	107.65883°W
6,600.00	90.01	285.73	3,659.51	954.42	-3,427.06	2,173,780.87	550,878.60	36.97381°N	107.65916°W
6,700.00	90.01	285.73	3,659.49	981.52	-3,523.32	2,173,807.98	550,782.34	36.97388°N	107.65949°W
6,800.00	90.01	285.73	3,659.47	1,008.63	-3,619.58	2,173,835.08	550,686.09	36.97396°N	107.65982°W
6,900.00	90.01	285.73	3,659.45	1,035.73	-3,715.83	2,173,862.19	550,589.83	36.97403°N	107.66015°W
7,000.00	90.01	285.73	3,659.43	1,062.83	-3,812.09	2,173,889.29	550,493.57	36.97411°N	107.66048°W
7,100.00	90.01	285.73	3,659.41	1,089.94	-3,908.35	2,173,916.39	550,397.32	36.97418°N	107.66081°W
7,200.00	90.01	285.73	3,659.39	1,117.04	-4,004.60	2,173,943.50	550,301.06	36.97426°N	107.66114°W
7,300.00	90.01	285.73	3,659.36	1,144.14	-4,100.86	2,173,970.60	550,204.80	36.97433°N	107.66147°W
7,400.00	90.01	285.73	3,659.34	1,171.25	-4,197.12	2,173,997.70	550,108.55	36.97441°N	107.66180°W
7,500.00	90.01	285.73	3,659.32	1,198.35	-4,293.37	2,174,024.81	550,012.29	36.97448°N	107.66213°W
7,600.00	90.01	285.73	3,659.30	1,225.45	-4,389.63	2,174,051.91	549,916.03	36.97456°N	107.66246°W
7,700.00	90.01	285.73	3,659.28	1,252.56	-4,485.89	2,174,079.01	549,819.78	36.97463°N	107.66279°W
7,800.00	90.01	285.73	3,659.26	1,279.66	-4,582.14	2,174,106.12	549,723.52	36.97471°N	107.66312°W
7,900.00	90.01	285.73	3,659.24	1,306.77	-4,678.40	2,174,133.22	549,627.26	36.97478°N	107.66344°W
8,000.00	90.01	285.73	3,659.22	1,333.87	-4,774.66	2,174,160.32	549,531.00	36.97486°N	107.66377°W
8,100.00	90.01	285.73	3,659.20	1,360.97	-4,870.92	2,174,187.43	549,434.75	36.97493°N	107.66410°W
8,200.00	90.01	285.73	3,659.18	1,388.08	-4,967.17	2,174,214.53	549,338.49	36.97501°N	107.66443°W
8,300.00	90.01	285.73	3,659.16	1,415.18	-5,063.43	2,174,241.64	549,242.23	36.97508°N	107.66476°W
8,400.00	90.01	285.73	3,659.14	1,442.28	-5,159.69	2,174,268.74	549,145.98	36.97516°N	107.66509°W
8,500.00	90.01	285.73	3,659.11	1,469.39	-5,255.94	2,174,295.85	549,049.72	36.97523°N	107.66542°W
8,600.00	90.01	285.73	3,659.09	1,496.49	-5,352.20	2,174,322.95	548,953.46	36.97531°N	107.66575°W
8,700.00	90.01	285.73	3,659.07	1,523.59	-5,448.46	2,174,350.05	548,857.21	36.97538°N	107.66608°W



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.23-T32N-R08W
Well: San Juan 32-8 Unit 254H
Wellbore: Lat 1
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,800.00	90.01	285.73	3,659.05	1,550.70	-5,544.71	2,174,377.15	548,760.95	36.97546°N	107.66641°W
8,900.00	90.01	285.73	3,659.03	1,577.80	-5,640.97	2,174,404.26	548,664.69	36.97553°N	107.66674°W
9,000.00	90.01	285.73	3,659.01	1,604.91	-5,737.23	2,174,431.36	548,568.44	36.97561°N	107.66707°W
9,050.32	90.01	285.73	3,659.00	1,618.54	-5,785.66	2,174,445.00	548,520.00	36.97565°N	107.66723°W
PBHL/TD									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SJ 32-8 Unit 254H FTP - plan hits target center - Point	0.00	0.00	3,606.32	248.45	-911.94	2,173,074.91	553,393.73	36.97186°N	107.65056°W
SJ 32-8 Unit 254H Toe - plan hits target center - Point	0.00	0.00	3,659.00	1,618.54	-5,785.66	2,174,445.00	548,520.00	36.97565°N	107.66723°W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,410.48	2,409.00	Ojo Alamo		0.00	
2,446.10	2,444.00	Kirtland		0.00	
3,607.31	3,412.00	Fruitland		0.00	
4,122.60	3,650.00	top of target		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,979.81	3,606.32	248.45	-911.94	FTP, Build 10"/100' DLS
4,229.81	3,660.00	312.08	-1,145.57	LP
4,246.35	3,660.00	316.49	-1,161.51	Hold Section
9,050.32	3,659.00	1,618.54	-5,785.66	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.23-T32N-R08W

San Juan 32-8 Unit 254H

Pilot Hole

Rev0

Anticollision Report

21 August, 2018





Koltek Energy Services

Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well San Juan 32-8 Unit 254H
Project:	San Juan Co., NM (NAD27)	TVD Reference:	KB @ 6977.00usft
Reference Site:	Sec.23-T32N-R08W	MD Reference:	KB @ 6977.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	San Juan 32-8 Unit 254H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev0	Offset TVD Reference:	Offset Datum

Reference	Rev0		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	08/21/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	4,546.94	Rev0 (Pilot Hole)	MWD	MWD - Standard	

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec.23-T32N-R08W						
San Juan 32-8 Unit 041 - Original Hole - Original Hole	2,411.55	2,411.26	204.65	174.14	6.709 CC	
San Juan 32-8 Unit 041 - Original Hole - Original Hole	2,500.00	2,497.80	205.46	173.28	6.385 ES	
San Juan 32-8 Unit 041 - Original Hole - Original Hole	2,700.00	2,689.08	218.36	182.55	6.098 SF	
San Juan 32-8 Unit 041A - Original Hole - Original Hole	1,084.26	1,075.39	61.70	57.30	14.035 CC, ES	
San Juan 32-8 Unit 041A - Original Hole - Original Hole	1,100.00	1,090.55	61.84	57.38	13.867 SF	
San Juan 32-8 Unit 254A - Original Hole - Original Hole	415.00	413.02	295.75	288.71	41.984 CC	
San Juan 32-8 Unit 254A - Original Hole - Original Hole	2,500.00	2,494.77	300.14	234.82	4.595 ES	
San Juan 32-8 Unit 254A - Original Hole - Original Hole	2,700.00	2,686.22	314.54	243.89	4.452 SF	

Offset Design												Offset Site Error:	
Survey Program: 143-INC_ONLY<10												Offset Well Error:	
Reference		Offset		Semi Major Axis			Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (usft)	Between Ellipses (usft)		Minimum Separation (usft)	Separation Factor
							+N/-S (usft)	+E/-W (usft)					
0.00	0.00	1.44	1.44	0.00	0.01	8.43	204.29	30.27	206.53				
100.00	100.00	100.82	100.82	0.10	0.48	8.43	204.23	30.27	206.46	205.89	0.57	361.720	
200.00	200.00	201.00	201.00	0.32	1.22	8.43	204.30	30.27	206.53	204.99	1.54	134.015	
300.00	300.00	301.00	301.00	0.55	2.16	8.43	204.30	30.27	206.53	203.82	2.71	76.251	
400.00	400.00	401.00	401.00	0.77	3.11	8.43	204.30	30.27	206.53	202.65	3.88	53.284	
500.00	500.00	501.00	501.00	0.99	4.05	8.43	204.30	30.27	206.53	201.48	5.04	40.950	
600.00	600.00	601.00	601.00	1.22	4.99	8.43	204.30	30.27	206.53	200.32	6.21	33.252	
700.00	700.00	701.00	701.00	1.44	5.93	8.43	204.30	30.27	206.53	199.15	7.38	27.991	
800.00	800.00	801.00	801.00	1.67	6.88	8.43	204.30	30.27	206.53	197.98	8.55	24.167	
900.00	900.00	901.00	901.00	1.89	7.82	8.43	204.30	30.27	206.53	196.82	9.71	21.262	
1,000.00	1,000.00	1,001.00	1,001.00	2.12	8.76	8.43	204.30	30.27	206.53	195.65	10.88	18.981	
1,100.00	1,100.00	1,101.00	1,101.00	2.34	9.71	8.43	204.30	30.27	206.53	194.48	12.05	17.142	
1,200.00	1,200.00	1,201.00	1,201.00	2.57	10.65	8.43	204.30	30.27	206.53	193.31	13.22	15.627	
1,300.00	1,300.00	1,301.00	1,301.00	2.79	11.59	8.43	204.30	30.27	206.53	192.15	14.38	14.359	
1,400.00	1,400.00	1,401.00	1,401.00	3.02	12.53	8.43	204.30	30.27	206.53	190.98	15.55	13.281	
1,500.00	1,500.00	1,501.00	1,501.00	3.24	13.48	8.43	204.30	30.27	206.53	189.81	16.72	12.354	
1,600.00	1,600.00	1,601.00	1,601.00	3.47	14.42	8.43	204.30	30.27	206.53	188.64	17.89	11.547	
1,700.00	1,700.00	1,701.34	1,701.34	3.69	15.50	8.43	204.18	30.27	206.41	187.22	19.19	10.754	
1,800.00	1,800.00	1,801.16	1,801.15	3.92	16.67	8.44	204.06	30.27	206.29	185.71	20.58	10.023	
1,884.00	1,884.00	1,885.00	1,885.00	4.11	17.64	8.44	204.03	30.27	206.26	184.51	21.75	9.484	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services
Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 041 - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 143-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
1,900.00	1,900.00	1,900.98	1,900.97	4.14	17.83	8.44	204.03	30.27	206.27	184.29	21.97	9.388			
2,000.00	2,000.00	2,000.79	2,000.79	4.37	18.99	8.44	204.09	30.27	206.32	182.96	23.36	8.832			
2,100.00	2,100.00	2,100.61	2,100.60	4.59	20.16	8.43	204.24	30.27	206.47	181.72	24.75	8.342			
2,122.68	2,122.68	2,123.25	2,123.24	4.64	20.42	8.43	204.28	30.27	206.51	181.45	25.06	8.239			
2,200.00	2,199.97	2,201.36	2,201.35	4.81	21.70	83.71	204.15	30.27	206.18	179.67	26.51	7.778			
2,300.00	2,299.65	2,300.96	2,300.95	5.02	23.38	85.89	203.99	30.27	205.31	176.91	28.40	7.230			
2,400.00	2,398.68	2,399.89	2,399.88	5.25	25.04	89.75	203.87	30.27	204.66	174.38	30.28	6.758			
2,411.55	2,410.05	2,411.26	2,411.25	5.27	25.23	90.30	203.86	30.27	204.65	174.14	30.50	6.709 CC			
2,500.00	2,496.67	2,497.80	2,497.78	5.50	26.69	95.16	203.79	30.27	205.46	173.28	32.18	6.385 ES			
2,600.00	2,593.27	2,594.31	2,594.30	5.80	28.31	101.84	203.76	30.27	209.39	175.35	34.04	6.151			
2,700.00	2,688.11	2,689.08	2,689.06	6.17	29.90	109.31	203.77	30.27	218.36	182.55	35.81	6.098 SF			
2,800.00	2,780.84	2,781.74	2,781.73	6.64	31.46	116.97	203.81	30.27	234.10	196.73	37.38	6.263			
2,900.00	2,871.12	2,871.96	2,871.94	7.22	32.98	124.24	203.89	30.27	257.79	219.13	38.66	6.668			
3,000.00	2,958.60	2,959.40	2,959.38	7.94	34.45	130.71	204.00	30.27	289.83	250.21	39.62	7.315			
3,100.00	3,042.97	3,043.73	3,043.71	8.82	35.87	136.22	204.14	30.27	330.04	289.78	40.26	8.197			
3,200.00	3,123.90	3,125.17	3,125.15	9.85	37.25	140.78	204.29	30.27	377.87	337.23	40.65	9.296			
3,300.00	3,201.10	3,202.27	3,202.25	11.05	39.00	144.44	204.15	30.27	432.59	391.44	41.14	10.514			
3,400.00	3,274.28	3,275.37	3,275.35	12.42	40.65	147.31	204.07	30.27	493.63	452.24	41.40	11.924			
3,500.00	3,343.16	3,344.20	3,344.18	13.95	42.21	149.50	204.03	30.27	560.37	518.92	41.46	13.517			
3,600.00	3,407.49	3,408.50	3,408.47	15.64	43.66	151.08	204.03	30.27	632.24	590.86	41.38	15.278			
3,700.00	3,467.02	3,468.03	3,468.00	17.48	45.01	152.11	204.07	30.27	708.72	667.46	41.25	17.179			
3,800.00	3,521.54	3,522.57	3,522.54	19.47	46.24	152.64	204.13	30.27	789.32	748.15	41.17	19.171			
3,900.00	3,570.84	3,571.91	3,571.87	21.58	47.35	152.63	204.21	30.27	873.62	832.33	41.29	21.158			
3,979.82	3,606.32	3,607.43	3,607.40	23.35	48.16	152.22	204.28	30.27	943.26	901.59	41.67	22.637			
4,000.00	3,614.85	3,615.97	3,615.94	23.81	48.35	152.68	204.30	30.27	961.12	919.44	41.67	23.063			
4,100.00	3,657.11	3,658.15	3,658.11	26.09	49.43	154.77	204.30	30.27	1,049.84	1,008.00	41.84	25.091			
4,200.00	3,699.38	3,700.41	3,700.38	28.40	50.52	156.58	204.30	30.27	1,138.86	1,096.75	42.11	27.044			
4,300.00	3,741.64	3,742.68	3,742.64	30.73	51.61	158.16	204.30	30.27	1,228.12	1,185.64	42.48	28.914			
4,400.00	3,783.90	3,784.94	3,784.90	33.07	52.69	159.55	204.30	30.27	1,317.56	1,274.64	42.92	30.700			
4,500.00	3,826.16	3,827.20	3,827.16	35.42	53.78	160.78	204.30	30.27	1,407.16	1,363.73	43.43	32.401			
4,546.94	3,846.00	3,847.04	3,847.00	36.52	54.29	161.31	204.30	30.27	1,449.26	1,405.57	43.69	33.171			



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 254A - Original Hole - Original Hole														Offset Site Error:	0.00 usft
Survey Program: 166-INC_ONLY<10														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
0.00	0.00	0.00	0.00	0.00	0.00	16.21	284.49	82.70	296.28						
100.00	100.00	97.78	97.78	0.10	0.71	16.22	284.32	82.70	296.10	295.29	0.81	366.994			
200.00	200.00	199.08	199.08	0.32	1.88	16.22	284.36	82.70	296.14	293.94	2.20	134.502			
300.00	300.00	298.59	298.58	0.55	3.91	16.23	284.07	82.70	295.86	291.41	4.45	66.424			
400.00	400.00	398.09	398.08	0.77	5.94	16.24	283.96	82.70	295.75	289.05	6.71	44.100			
415.00	415.00	413.02	413.01	0.80	6.24	16.24	283.95	82.70	295.75	288.71	7.04	41.984 CC			
500.00	500.00	497.58	497.58	0.99	7.96	16.23	284.02	82.70	295.81	286.85	8.96	33.020			
600.00	600.00	597.07	597.06	1.22	9.99	16.22	284.25	82.70	296.04	284.83	11.21	26.407			
700.00	700.00	698.01	698.00	1.44	12.28	16.21	284.49	82.70	296.27	282.55	13.72	21.589			
800.00	800.00	798.01	798.00	1.67	14.92	16.21	284.49	82.70	296.27	279.68	16.59	17.854			
900.00	900.00	898.02	898.00	1.89	17.57	16.21	284.49	82.70	296.27	276.81	19.46	15.221			
1,000.00	1,000.00	998.02	998.00	2.12	20.22	16.21	284.49	82.70	296.27	273.94	22.33	13.265			
1,100.00	1,100.00	1,098.03	1,098.00	2.34	22.86	16.21	284.49	82.70	296.27	271.06	25.20	11.755			
1,200.00	1,200.00	1,198.03	1,198.00	2.57	25.51	16.21	284.49	82.70	296.27	268.19	28.08	10.553			
1,300.00	1,300.00	1,298.04	1,298.00	2.79	28.15	16.21	284.49	82.70	296.27	265.32	30.95	9.574			
1,400.00	1,400.00	1,398.04	1,398.00	3.02	30.80	16.21	284.49	82.70	296.27	262.45	33.82	8.760			
1,500.00	1,500.00	1,498.05	1,498.00	3.24	33.45	16.21	284.49	82.70	296.27	259.57	36.69	8.074			
1,600.00	1,600.00	1,598.05	1,598.00	3.47	36.10	16.21	284.49	82.70	296.27	256.70	39.57	7.487			
1,700.00	1,700.00	1,698.06	1,698.00	3.69	38.75	16.21	284.49	82.70	296.27	253.83	42.44	6.980			
1,800.00	1,800.00	1,798.06	1,798.00	3.92	41.40	16.21	284.49	82.70	296.27	250.95	45.32	6.538			
1,900.00	1,900.00	1,898.07	1,898.00	4.14	44.05	16.21	284.49	82.70	296.27	248.08	48.19	6.148			
2,000.00	2,000.00	1,998.07	1,998.00	4.37	46.70	16.21	284.49	82.70	296.27	245.20	51.07	5.802			
2,100.00	2,100.00	2,098.08	2,098.00	4.59	49.35	16.21	284.49	82.70	296.27	242.33	53.94	5.492			
2,122.68	2,122.68	2,120.76	2,120.68	4.64	49.95	16.21	284.49	82.70	296.27	241.67	54.59	5.427			
2,200.00	2,199.97	2,198.06	2,197.97	4.81	52.00	91.32	284.49	82.70	296.31	239.50	56.81	5.216			
2,300.00	2,299.65	2,297.74	2,297.65	5.02	54.64	92.81	284.49	82.70	296.59	236.93	59.66	4.971			
2,400.00	2,398.68	2,396.77	2,396.68	5.25	57.27	95.41	284.49	82.70	297.59	235.09	62.50	4.761			
2,500.00	2,496.67	2,494.77	2,494.67	5.50	59.86	99.02	284.49	82.70	300.14	234.82	65.32	4.595 ES			
2,600.00	2,593.27	2,591.37	2,591.27	5.80	62.42	103.47	284.49	82.70	305.36	237.29	68.06	4.486			
2,700.00	2,688.11	2,686.22	2,686.11	6.17	64.94	108.52	284.49	82.70	314.54	243.89	70.65	4.452 SF			
2,800.00	2,780.84	2,778.95	2,778.84	6.64	67.40	113.87	284.49	82.70	329.00	256.02	72.98	4.508			
2,900.00	2,871.12	2,869.24	2,869.12	7.22	69.79	119.20	284.49	82.70	349.84	274.92	74.92	4.669			
3,000.00	2,958.60	2,956.73	2,956.60	7.94	72.11	124.24	284.49	82.70	377.83	301.42	76.41	4.945			
3,100.00	3,042.97	3,041.10	3,040.97	8.82	74.34	128.82	284.49	82.70	413.28	335.89	77.39	5.340			
3,200.00	3,123.90	3,122.03	3,121.90	9.85	76.49	132.81	284.49	82.70	456.16	378.27	77.89	5.856			
3,300.00	3,201.10	3,199.24	3,199.10	11.05	78.53	136.19	284.49	82.70	506.16	428.20	77.96	6.492			
3,400.00	3,274.28	3,272.42	3,272.28	12.42	80.47	138.95	284.49	82.70	562.83	485.14	77.68	7.245			
3,500.00	3,343.16	3,341.30	3,341.16	13.95	82.30	141.11	284.49	82.70	625.61	548.45	77.16	8.108			
3,600.00	3,407.49	3,405.63	3,405.49	15.64	84.01	142.70	284.49	82.70	693.98	617.47	76.51	9.071			
3,700.00	3,467.02	3,465.17	3,465.02	17.48	85.58	143.75	284.49	82.70	767.39	691.50	75.89	10.112			
3,800.00	3,521.54	3,519.69	3,519.54	19.47	87.03	144.23	284.49	82.70	845.32	769.83	75.49	11.198			
3,900.00	3,570.84	3,568.99	3,568.84	21.58	88.34	144.13	284.49	82.70	927.29	851.71	75.58	12.268			
3,979.82	3,606.32	3,604.48	3,604.32	23.35	89.28	143.58	284.49	82.70	995.30	919.06	76.24	13.056			
4,000.00	3,614.85	3,613.01	3,612.85	23.81	89.50	144.11	284.49	82.70	1,012.77	936.71	76.07	13.314			
4,100.00	3,657.11	3,655.27	3,655.11	26.09	90.62	146.50	284.49	82.70	1,099.76	1,024.43	75.33	14.598			
4,200.00	3,699.38	3,697.54	3,697.38	28.40	91.74	148.63	284.49	82.70	1,187.29	1,112.54	74.75	15.883			
4,300.00	3,741.64	3,739.80	3,739.64	30.73	92.86	150.53	284.49	82.70	1,275.26	1,200.95	74.31	17.161			
4,400.00	3,783.90	3,782.06	3,781.90	33.07	93.98	152.23	284.49	82.70	1,363.57	1,289.57	74.01	18.425			
4,500.00	3,826.16	3,824.33	3,824.16	35.42	95.10	153.75	284.49	82.70	1,452.17	1,378.35	73.82	19.671			
4,546.94	3,846.00	3,844.17	3,844.00	36.52	95.63	154.42	284.49	82.70	1,493.85	1,420.07	73.77	20.249			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Koltek Energy Services

Anticollision Report



Company: Hilcorp Energy Company
 Project: San Juan Co., NM (NAD27)
 Reference Site: Sec.23-T32N-R08W
 Site Error: 0.00 usft
 Reference Well: San Juan 32-8 Unit 254H
 Well Error: 0.00 usft
 Reference Wellbore: Pilot Hole
 Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
 TVD Reference: KB @ 6977.00usft
 MD Reference: KB @ 6977.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: EDM 5000.1 Single User Db
 Offset TVD Reference: Offset Datum

Offset Design Sec.23-T32N-R08W - San Juan 32-8 Unit 041A - Original Hole - Original Hole													Offset Site Error:	0.00 usft
Survey Program: 375-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)		+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
0.00	0.00	0.00	0.00	0.00	0.00	-57.58	54.81	-86.28	103.46					
100.00	100.00	83.94	83.94	0.10	0.10	-57.69	54.65	-86.41	102.24	102.05	0.19	536.757		
200.00	200.00	183.87	183.86	0.32	0.21	-58.10	54.08	-86.88	102.34	101.81	0.53	193.799		
300.00	300.00	283.78	283.77	0.55	0.33	-58.83	53.07	-87.71	102.52	101.65	0.87	118.426		
400.00	400.00	383.86	383.83	0.77	0.45	-59.85	51.63	-88.88	102.79	101.58	1.21	84.866		
500.00	500.00	485.88	485.84	0.99	0.65	-60.17	50.72	-88.47	102.00	100.36	1.64	62.202		
600.00	600.00	588.38	588.27	1.22	0.86	-58.88	51.16	-84.75	99.09	97.02	2.07	47.889		
700.00	700.00	691.50	691.05	1.44	1.09	-55.74	52.21	-76.65	93.01	90.48	2.53	36.768		
800.00	800.00	793.15	791.94	1.67	1.35	-50.04	53.96	-64.39	84.39	81.37	3.02	27.954		
900.00	900.00	894.23	891.67	1.89	1.67	-40.52	56.38	-48.19	74.56	71.03	3.53	21.114		
1,000.00	1,000.00	993.52	988.81	2.12	2.04	-25.35	58.67	-27.80	65.10	61.06	4.03	16.136		
1,084.26	1,084.26	1,075.39	1,068.26	2.31	2.40	-7.60	61.15	-8.16	61.70	57.30	4.40	14,035 CC, ES		
1,100.00	1,100.00	1,090.55	1,082.88	2.34	2.47	-3.94	61.68	-4.25	61.84	57.38	4.46	13,867 SF		
1,200.00	1,200.00	1,185.21	1,173.69	2.57	2.97	18.71	65.58	22.21	70.00	65.08	4.93	14.214		
1,300.00	1,300.00	1,278.32	1,261.96	2.79	3.52	36.00	70.71	51.38	90.14	84.54	5.60	16.098		
1,400.00	1,400.00	1,371.51	1,349.63	3.02	4.12	47.33	76.06	82.50	117.36	110.94	6.42	18.283		
1,500.00	1,500.00	1,463.53	1,435.58	3.24	4.75	55.20	80.02	115.13	148.34	141.04	7.30	20.318		
1,600.00	1,600.00	1,559.68	1,525.11	3.47	5.40	60.79	83.84	149.95	181.60	173.40	8.20	22.138		
1,700.00	1,700.00	1,657.31	1,616.98	3.69	6.01	64.74	86.33	182.93	213.09	204.02	9.06	23.509		
1,800.00	1,800.00	1,749.28	1,703.57	3.92	6.59	67.48	88.65	213.82	245.05	235.16	9.89	24.789		
1,900.00	1,900.00	1,844.03	1,792.61	4.14	7.19	69.32	92.83	245.94	278.30	267.59	10.72	25.969		
2,000.00	2,000.00	1,940.58	1,883.73	4.37	7.80	70.79	96.74	277.63	310.63	299.08	11.55	26.895		
2,100.00	2,100.00	2,033.25	1,971.15	4.59	8.40	71.98	100.23	308.16	343.14	330.76	12.37	27.728		
2,122.68	2,122.68	2,053.97	1,990.67	4.64	8.54	72.23	101.00	315.08	350.62	338.06	12.56	27.907		
2,200.00	2,199.97	2,126.14	2,058.59	4.81	9.03	147.41	103.55	339.35	377.76	367.81	9.95	37.973		
2,300.00	2,299.65	2,218.50	2,145.54	5.02	9.63	148.19	106.16	370.37	417.05	406.72	10.33	40.358		
2,400.00	2,398.68	2,306.42	2,228.35	5.25	10.19	148.98	108.69	399.81	461.27	450.60	10.67	43.237		
2,500.00	2,496.67	2,391.38	2,308.28	5.50	10.74	149.63	111.98	428.44	510.82	499.84	10.97	46.557		
2,600.00	2,593.27	2,475.72	2,387.68	5.80	11.29	150.29	115.00	456.68	564.99	553.74	11.25	50.225		
2,700.00	2,688.11	2,552.26	2,459.71	6.17	11.79	150.63	118.61	482.32	624.06	612.55	11.51	54.241		
2,800.00	2,780.84	2,631.88	2,534.65	6.64	12.31	150.92	122.97	508.84	687.61	675.85	11.76	58.446		
2,900.00	2,871.12	2,712.16	2,610.43	7.22	12.81	151.16	127.38	534.98	754.95	742.91	12.03	62.746		
3,000.00	2,958.60	2,780.06	2,674.69	7.94	13.24	150.98	131.51	556.52	825.88	813.54	12.34	66.921		
3,100.00	3,042.97	2,838.00	2,729.39	8.82	13.61	150.45	135.01	575.31	901.23	888.49	12.74	70.759		
3,200.00	3,123.90	2,892.63	2,780.88	9.85	13.97	149.71	137.87	593.33	980.58	967.31	13.27	73.906		
3,300.00	3,201.10	2,933.00	2,818.92	11.05	14.24	148.33	139.48	606.76	1,063.49	1,049.46	14.03	75.790		
3,400.00	3,274.28	2,979.85	2,862.97	12.42	14.57	146.85	141.17	622.61	1,149.74	1,134.69	15.05	76.417		
3,500.00	3,343.16	3,012.53	2,893.60	13.95	14.79	144.31	142.43	633.93	1,239.08	1,222.53	16.56	74.836		
3,600.00	3,407.49	3,042.61	2,921.74	15.64	15.00	140.91	143.63	644.52	1,331.01	1,312.35	18.66	71.315		
3,700.00	3,467.02	3,070.19	2,947.51	17.48	15.20	136.31	144.62	654.28	1,424.98	1,403.44	21.54	66.151		
3,800.00	3,521.54	3,091.91	2,967.80	19.47	15.35	129.72	145.31	661.98	1,520.61	1,495.13	25.47	59.694		
3,900.00	3,570.84	3,107.78	2,982.64	21.58	15.47	120.16	145.76	667.62	1,617.51	1,586.91	30.60	52.859		
3,979.82	3,606.32	3,116.29	2,990.59	23.35	15.53	109.64	145.98	670.64	1,695.51	1,660.24	35.27	48.072		
4,000.00	3,614.85	3,117.98	2,992.16	23.81	15.54	109.89	146.02	671.24	1,715.30	1,679.65	35.65	48.114		
4,100.00	3,657.11	3,123.00	2,996.86	26.09	15.58	110.65	146.15	673.03	1,813.43	1,775.79	37.64	48.180		
4,200.00	3,699.38	3,134.20	3,007.32	28.40	15.66	112.29	146.43	677.02	1,911.72	1,872.32	39.40	48.521		
4,300.00	3,741.64	3,142.15	3,014.74	30.73	15.71	113.43	146.63	679.86	2,010.14	1,968.89	41.25	48.735		
4,400.00	3,783.90	3,150.04	3,022.11	33.07	15.77	114.53	146.84	682.68	2,108.67	2,065.61	43.07	48.962		
4,500.00	3,826.16	3,157.87	3,029.42	35.42	15.83	115.59	147.05	685.48	2,207.31	2,162.45	44.86	49.202		
4,546.94	3,846.00	3,161.53	3,032.83	36.52	15.85	116.08	147.15	686.79	2,253.64	2,207.95	45.70	49.319		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



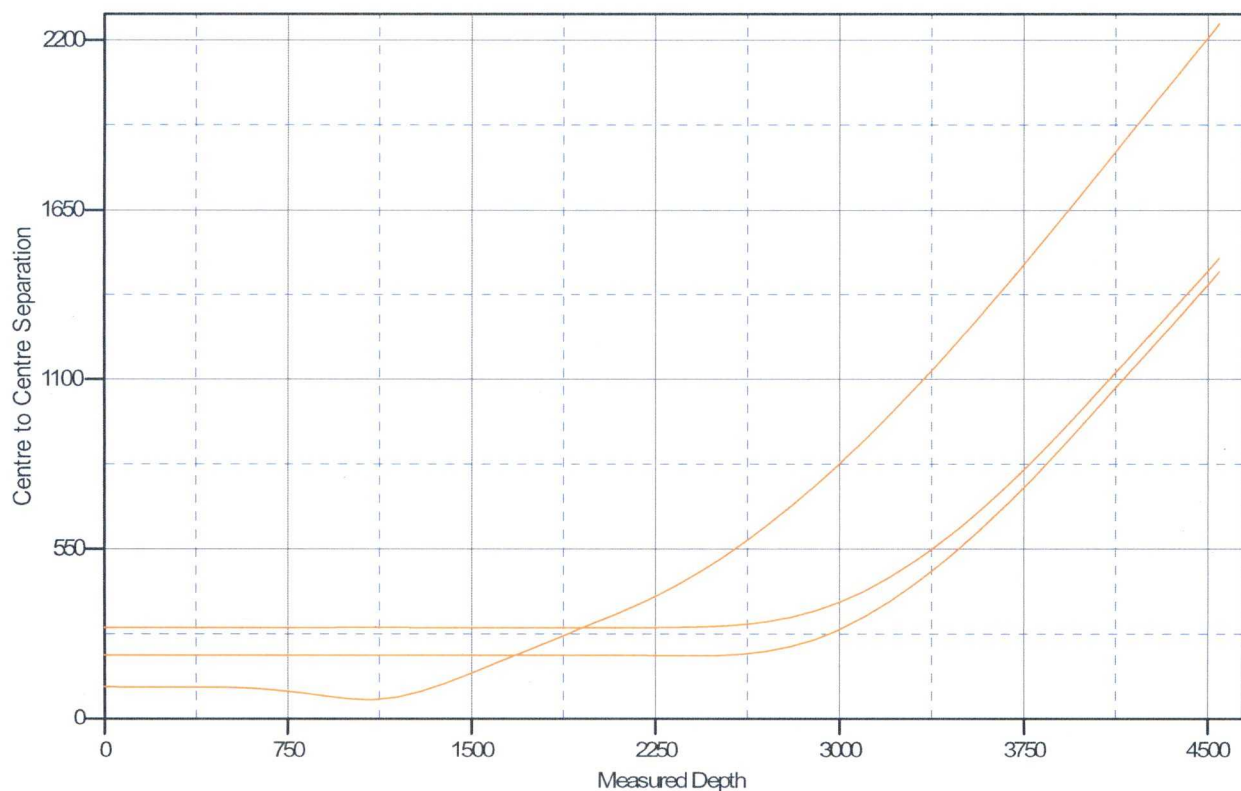
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6977.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: San Juan 32-8 Unit 254H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.11°

Ladder Plot



LEGEND

San Juan 32-8 Unit 254A, Original Hole, Original Hole V0 — San Juan 32-8 Unit 041, Original Hole, Original Hole V0 — San Juan 32-8 Unit 041A, Original Hole, Original Hole V0



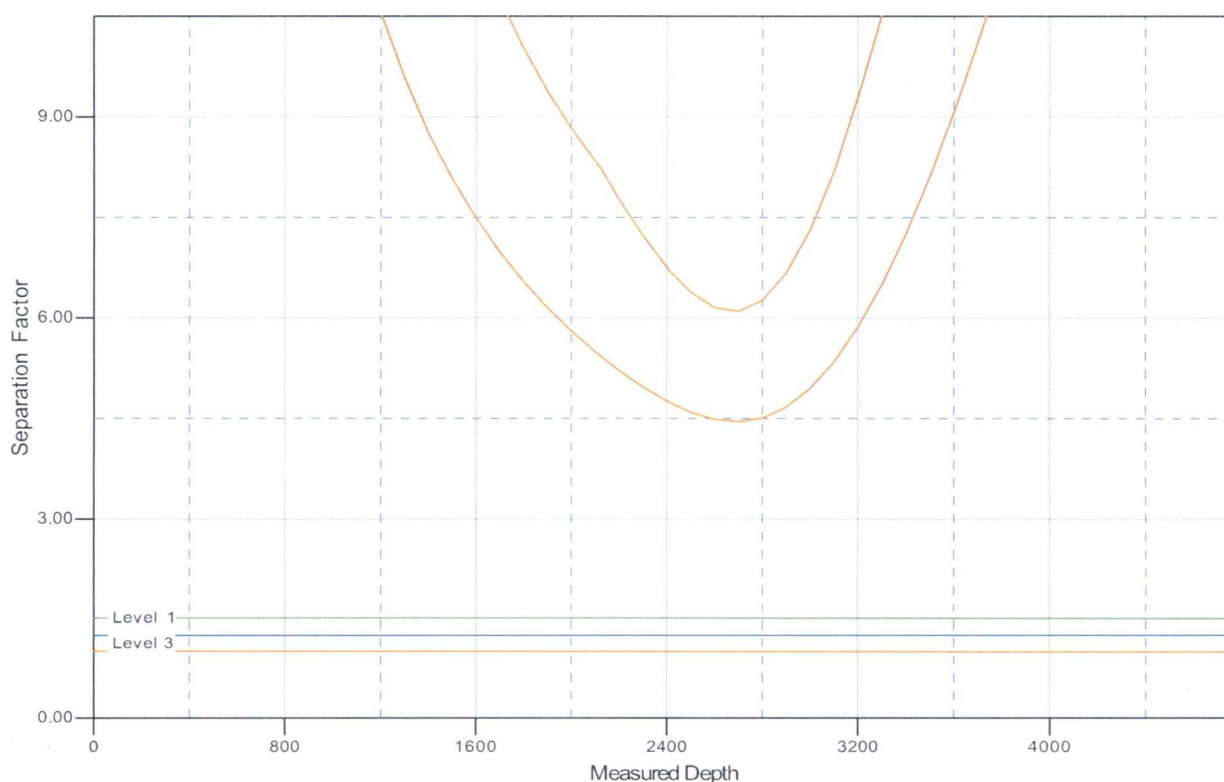
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Reference Site: Sec.23-T32N-R08W
Site Error: 0.00 usft
Reference Well: San Juan 32-8 Unit 254H
Well Error: 0.00 usft
Reference Wellbore: Pilot Hole
Reference Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 6977.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: San Juan 32-8 Unit 254H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.11°

Separation Factor Plot

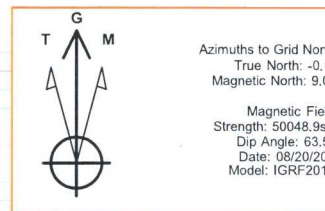
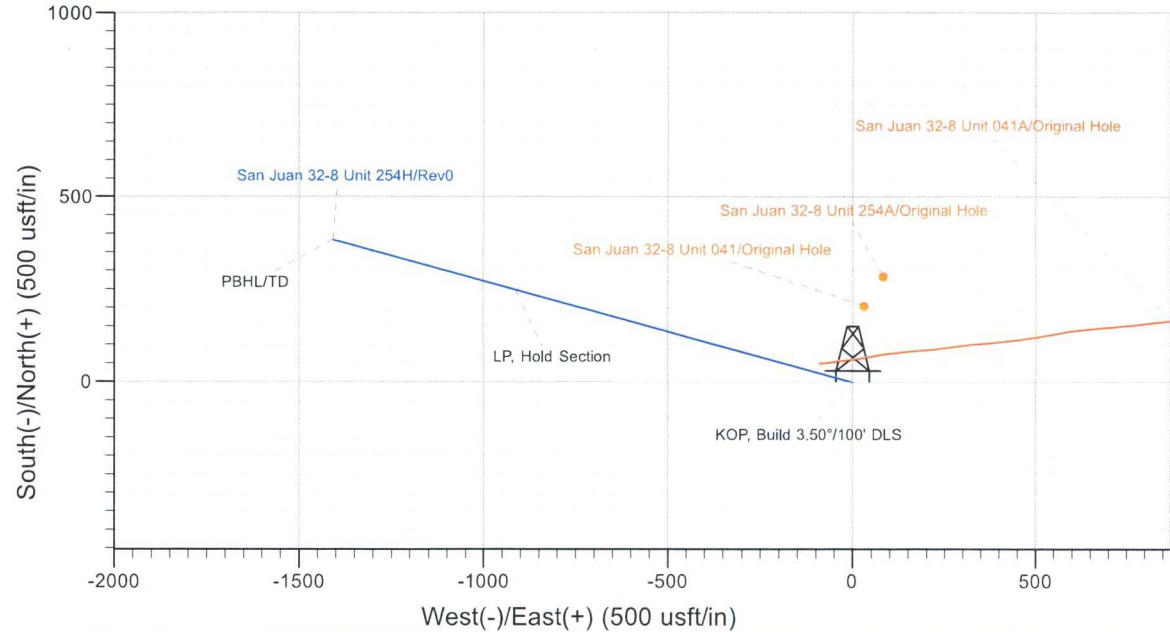
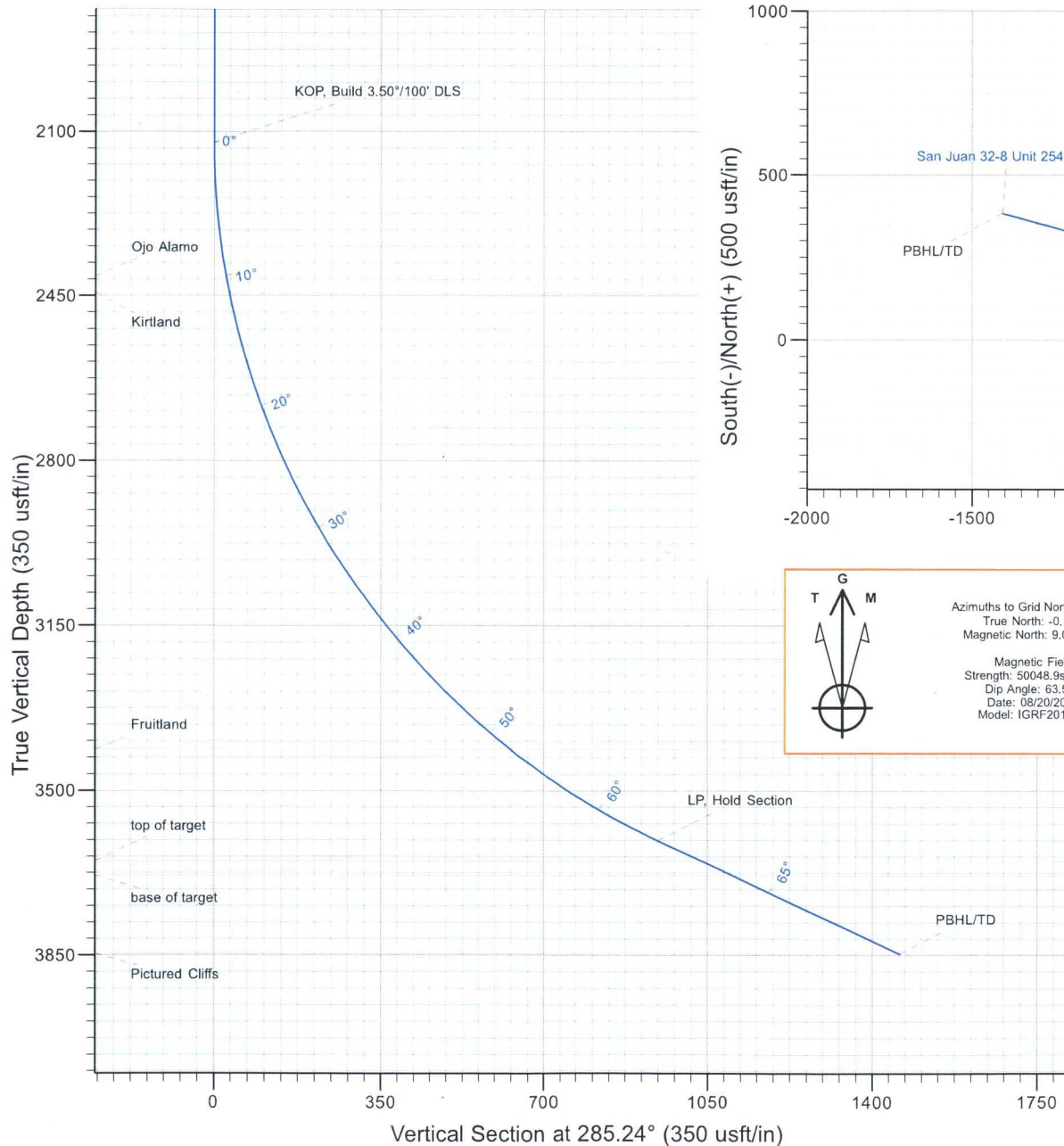


LEGEND

San Juan 32-8 Unit 254A, Original Hole, Original Hole V0 San Juan 32-8 Unit 041, Original Hole, Original Hole V0 San Juan 32-8 Unit 041A, Original Hole, Original Hole V0



Company: Hilcorp Energy Company
 Field: San Juan Co., NM (NAD27)
 Location: Sec.23-T32N-R08W
 Well: San Juan 32-8 Unit 254H
 Borehole: Pilot Hole
 Plan: Rev0



WELL DETAILS: San Juan 32-8 Unit 254H									
GL 6962.00		KB @ 6977.00usft		Latitude		Longitude			
+N/-S	+E/-W	Northing	Easting	36° 58' 16.208 N		107° 38' 50.766 W			
0.00	0.00	2172826.46	554305.66						
SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2122.68	0.00	0.00	2122.68	0.00	0.00	0.00	0.00	0.00
3	3979.82	65.00	285.24	3606.32	248.45	-911.95	3.50	285.24	945.18
4	4546.94	65.00	285.24	3846.00	383.56	-1407.86	0.00	0.00	1459.17

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
2409.00	2410.48	Ojo Alamo
2444.00	2446.10	Kirtland
3412.00	3607.31	Fruitland
3650.00	4083.17	top of target
3680.00	4154.15	base of target
3846.00	4546.94	Pictured Cliffs

ANNOTATIONS		
TVD	MD	Annotation
2122.68	2122.68	KOP, Build 3.50°/100' DLS
3606.32	3979.82	LP, Hold Section
3846.00	4546.94	PBHL/TD



Hilcorp Energy Company

San Juan Co., NM (NAD27)

Sec.23-T32N-R08W

San Juan 32-8 Unit 254H

Pilot Hole

Plan: Rev0

Standard Planning Report

21 August, 2018





Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.23-T32N-R08W
Well: San Juan 32-8 Unit 254H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	San Juan Co., NM (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site	Sec.23-T32N-R08W		
Site Position:		Northing:	2,172,826.46 usft
From:	Map	Easting:	554,305.66 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	36° 58' 16.208 N
		Longitude:	107° 38' 50.766 W
		Grid Convergence:	0.11 °

Well	San Juan 32-8 Unit 254H		
Well Position	+N/-S	0.00 usft	Northing: 2,172,826.46 usft
	+E/-W	0.00 usft	Easting: 554,305.66 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36° 58' 16.208 N
		Longitude:	107° 38' 50.766 W
		Ground Level:	6,962.00 usft

Wellbore	Pilot Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	08/20/18	9.12	63.54	50,049

Design	Rev0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	285.24

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,122.68	0.00	0.00	2,122.68	0.00	0.00	0.00	0.00	0.00	0.00	
3,979.82	65.00	285.24	3,606.32	248.45	-911.95	3.50	3.50	0.00	285.24	
4,546.94	65.00	285.24	3,846.00	383.56	-1,407.86	0.00	0.00	0.00	0.00	



Koltek Energy Services
Planning Report



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.23-T32N-R08W
Well: San Juan 32-8 Unit 254H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,122.68	0.00	0.00	2,122.68	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Build 3.50°/100' DLS									
2,200.00	2.71	285.24	2,199.97	0.48	-1.76	1.83	3.50	3.50	0.00
2,300.00	6.21	285.24	2,299.65	2.52	-9.26	9.59	3.50	3.50	0.00
2,400.00	9.71	285.24	2,398.68	6.16	-22.61	23.43	3.50	3.50	0.00
2,500.00	13.21	285.24	2,496.67	11.38	-41.77	43.29	3.50	3.50	0.00
2,600.00	16.71	285.24	2,593.27	18.16	-66.67	69.10	3.50	3.50	0.00
2,700.00	20.21	285.24	2,688.11	26.48	-97.21	100.75	3.50	3.50	0.00
2,800.00	23.71	285.24	2,780.84	36.31	-133.28	138.13	3.50	3.50	0.00
2,900.00	27.21	285.24	2,871.12	47.61	-174.74	181.11	3.50	3.50	0.00
3,000.00	30.71	285.24	2,958.60	60.33	-221.44	229.52	3.50	3.50	0.00
3,100.00	34.21	285.24	3,042.97	74.44	-273.21	283.17	3.50	3.50	0.00
3,200.00	37.71	285.24	3,123.90	89.87	-329.86	341.88	3.50	3.50	0.00
3,300.00	41.21	285.24	3,201.10	106.57	-391.16	405.42	3.50	3.50	0.00
3,400.00	44.71	285.24	3,274.28	124.48	-456.90	473.55	3.50	3.50	0.00
3,500.00	48.21	285.24	3,343.16	143.53	-526.82	546.03	3.50	3.50	0.00
3,600.00	51.71	285.24	3,407.49	163.65	-600.68	622.57	3.50	3.50	0.00
3,700.00	55.21	285.24	3,467.02	184.77	-678.18	702.90	3.50	3.50	0.00
3,800.00	58.71	285.24	3,521.54	206.80	-759.04	786.71	3.50	3.50	0.00
3,900.00	62.21	285.24	3,570.84	229.66	-842.97	873.70	3.50	3.50	0.00
3,979.82	65.00	285.24	3,606.32	248.45	-911.95	945.18	3.50	3.50	0.00
LP, Hold Section									
4,000.00	65.00	285.24	3,614.85	253.26	-929.59	963.47	0.00	0.00	0.00
4,100.00	65.00	285.24	3,657.11	277.09	-1,017.04	1,054.11	0.00	0.00	0.00
4,200.00	65.00	285.24	3,699.38	300.91	-1,104.48	1,144.74	0.00	0.00	0.00
4,300.00	65.00	285.24	3,741.64	324.73	-1,191.92	1,235.37	0.00	0.00	0.00
4,400.00	65.00	285.24	3,783.90	348.56	-1,279.37	1,326.00	0.00	0.00	0.00
4,500.00	65.00	285.24	3,826.16	372.38	-1,366.81	1,416.63	0.00	0.00	0.00
4,546.94	65.00	285.24	3,846.00	383.56	-1,407.86	1,459.17	0.00	0.00	0.00
PBHL/TD									



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan Co., NM (NAD27)
Site: Sec.23-T32N-R08W
Well: San Juan 32-8 Unit 254H
Wellbore: Pilot Hole
Design: Rev0

Local Co-ordinate Reference: Well San Juan 32-8 Unit 254H
TVD Reference: KB @ 6977.00usft
MD Reference: KB @ 6977.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,410.48	2,409.00	Ojo Alamo		0.00	
2,446.10	2,444.00	Kirtland		0.00	
3,607.31	3,412.00	Fruitland		0.00	
4,083.17	3,650.00	top of target		0.00	
4,154.15	3,680.00	base of target		0.00	
4,546.94	3,846.00	Pictured Cliffs		0.00	

Plan Annotations

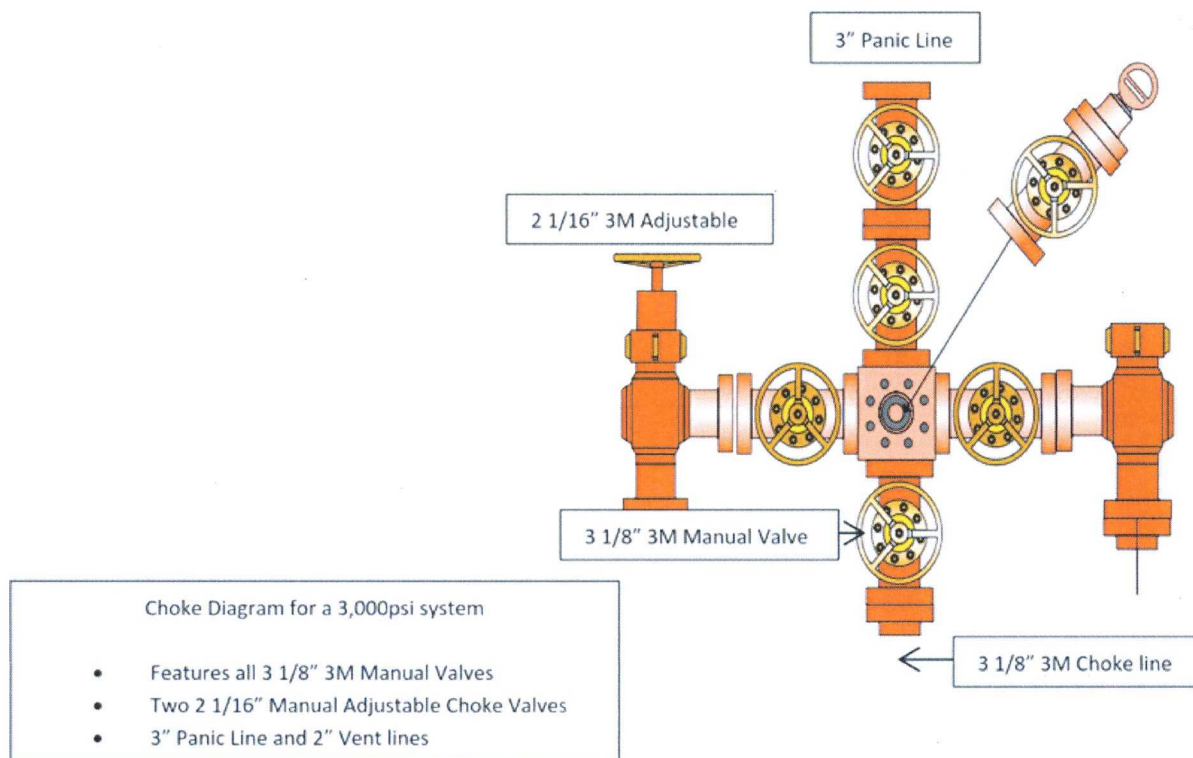
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,122.68	2,122.68	0.00	0.00	KOP, Build 3.50°/100' DLS
3,979.82	3,606.32	248.45	-911.95	LP, Hold Section
4,546.94	3,846.00	383.56	-1,407.86	PBHL/TD



Hilcorp Energy Company

San Juan Unit 32-8 #254H

Choke Manifold Schematic – Aztec 777



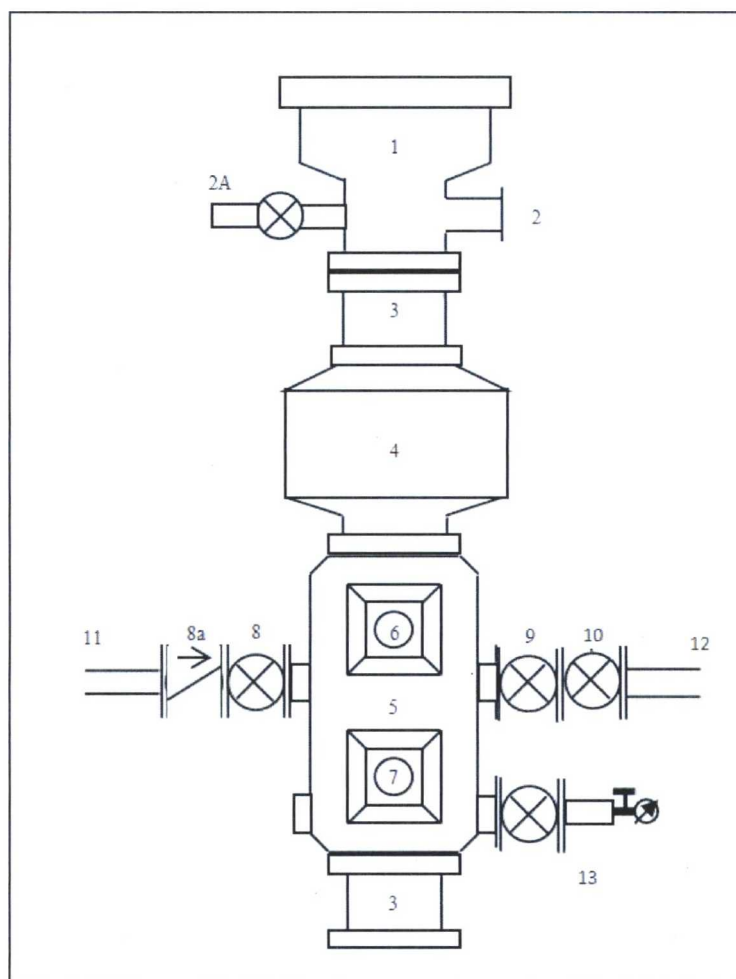


Hilcorp Energy Company

San Juan Unit 32-8 #254H

BOPE Schematic – Aztec 777

1. Rotating Head
2. Flow line
- 2A. Fill up line and valve
3. Spacer Spools (as needed)
4. 11" 3M Annular Preventer
5. 11" 3M Double Ram Preventer
6. Blind Rams
7. Pipe Rams
8. 3M Gate Valve (2")
- 8a. Check valve
9. 3M Manual Gate Valve (3")
10. 3M Manual Gate Valve (3")
11. Kill Line Connection, 2" hard line
12. Choke Line (3" Co-Flex)
13. Secondary outlet with valve, bull plug, needle valve, and pressure gauge



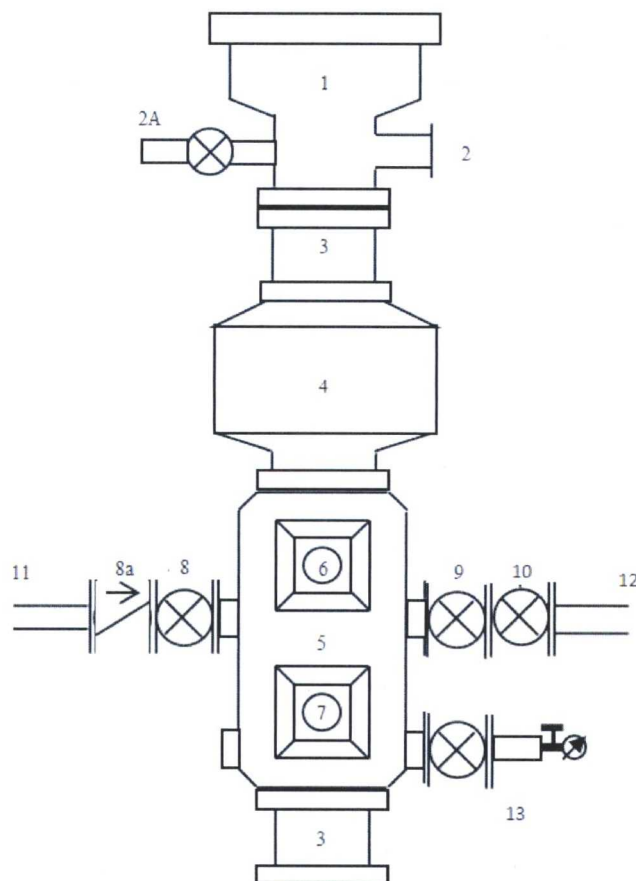
San Juan Unit 32-8 #254H



Hilcorp Energy Company

BOPE Schematic – Aztec 777

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Directions from the Intersection of US Hwy 550 & State Hwy 173

in Aztec, NM to Hilcorp Energy Company San Juan 32-8 Unit #254H

1893' FNL & 1684' FWL, Section 23, T32N, R8W, N.M.P.M., San Juan County, NM

Latitude: 36.971173°N Longitude: 107.648047°W Datum: NAD1983

From the intersection of US Hwy 550 & State Hwy 173 in Aztec, NM, travel Easterly on State Hwy 173 for 1.0 mile to fork in roadway;

Go Left (Easterly) remaining on State Hwy 173 for 17.0 miles to Tee-intersection;

Go Left (North-Easterly) exiting State Hwy 173 onto State Hwy 511 for 19.7 miles to existing roadway on right-hand side of State Hwy 511 @ Mile Marker 27.8;

Go Right (South-easterly) exiting State Hwy 511 onto existing roadway for 0.1 mile to existing Hilcorp San Juan 32-8 Unit #41A well location, with the Hilcorp San Juan 32-8 Unit #254H staked offset #41A wellhead.