

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

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

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

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

State of New Mexico

Form C-101
Revised July 18, 2013

Energy Minerals and Natural Resources

Oil Conservation Division

☐ AMENDED REPORT

1220 South St. Francis Dr.

Santa Fe, NM 87505

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address Hilcorp Energy Company 382 Road 3100 Aztec, NM 87410		² OGRID Number 372171
		³ API Number 30-039-24294
⁴ Property Code 318714	⁵ Property Name San Juan 29-7 Unit NP	⁶ Well No. 516

⁷ Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
K	36	029N	07W		1711	South	1527	West	Rio Arriba

⁸ Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
M	36	029N	07W		660	South	660	West	Rio Arriba

⁹ Pool Information

Pool Name	Pool Code
Blanco Mesaverde / Basin Mancos / Basin Dakota	72319, 97232, 71599

Additional Well Information

¹¹ Work Type Recomplete	¹² Well Type Commingle	¹³ Cable/Rotary	¹⁴ Lease Type State	¹⁵ Ground Level Elevation 6,833' GR
¹⁶ Multiple Commingle	¹⁷ Proposed Depth 8,501'	¹⁸ Formation Blanco MV / Basin MC / Basin DK	¹⁹ Contractor	²⁰ Spud Date
Depth to Ground water	Distance from nearest fresh water well		Distance to nearest surface water	

☒ We will be using a closed-loop system in lieu of lined pits²¹ Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	12 1/4"	9 5/8"	36# K-55	522'	Existing	
Int	8 3/4"	7"	20# K-55	3415'	100 sx	3,190'
Prod	6 1/4"	4 1/2"	11.6# J-55	8,200'	641 sx	2,700'

Casing/Cement Program: Additional Comments

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²² Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
	3M	Low 250 psi/High 3000 psi	

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.
I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐, if applicable.
Signature: **Cherylene Weston**

OIL CONSERVATION DIVISION

Approved By:

Printed name: Cherylene Weston

Title:

Title: Operations Regulatory Tech Sr.

Approved Date:

Expiration Date:

E-mail Address: cweston@hilcorp.com

Date: 7/11/2024

Phone: 713-289-2615

Conditions of Approval Attached

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Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form O-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-24294	² Pool Code 72319 97232 / 71599	³ Pool Name Blanco Mesaverde BASIN MANCOS / BASIN DAKOTA
⁴ Property Code 318714	⁵ Property Name SAN JUAN 29-7 UNIT NP	⁶ Well Number 516
⁷ GRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6819'

¹⁰ Surface Location

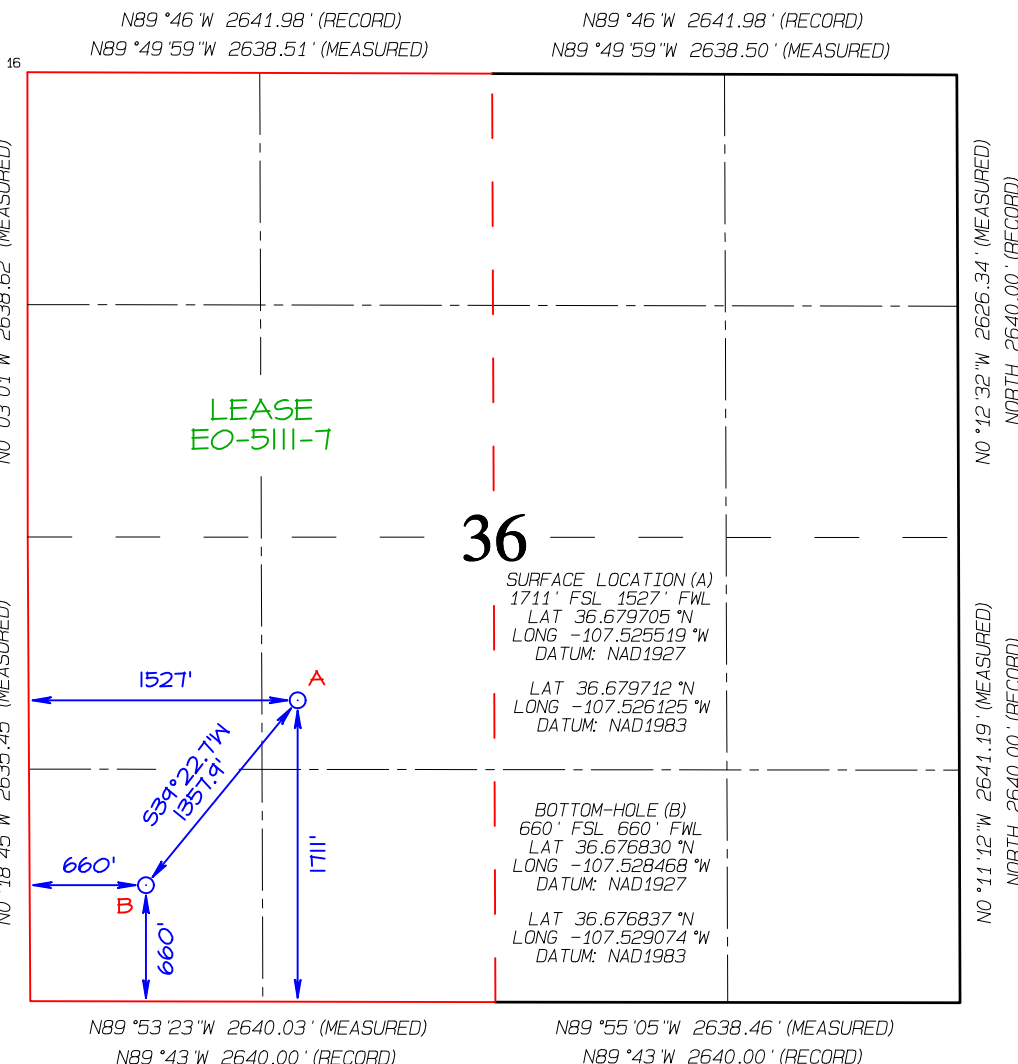
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	36	29N	7W		1711	SOUTH	1527	WEST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	36	29N	7W		660	SOUTH	660	WEST	RIO ARriba

¹² Dedicated Acres 320.00	W/2 - Section 36	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE
BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

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.

Cherylene Weston 6/25/2024

Signature Date
Cheryl Weston, Ops/Regulatory Tech
Printed Name
cweston@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: MAY 8, 2024
Date of Survey: MAY 3, 2024

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

Rio Arriba County, NM

San Juan 29-6 Unit 118

Hilcorp Energy Company

Technical Drilling Plan (Rev. 0)

Hilcorp Energy Company proposes to drill and complete the referenced well targeting Mesa Verde & Dakota formations.

Note: This technical drilling plan will be adjusted based upon actual conditions.

1. Location

Date:	June 25, 2024	Pool:	MV/DK
Well Name:	San Juan 29-6 Unit 118	Ground Elevation	6380'
Surface Hole Location:	36.6781000° N, -107.4816500° W	County, State:	Rio Arriba, NM
Production Depth (ft.)	8,125' MD / 8,000' TVD	Production BHL:	36.6766100° N, -107.4792900° W

Note: All depths in the directional drilling plan are referenced from an estimated RKB datum of 15' above ground level.

2. Geological Markers

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

Formation	Depth (ft. TVD)	Remarks
Ojo Alamo	2367'	Water (fresh/useable)
Kirtland	2545'	None
Fruitland	2852'	Gas, Water
Pictured Cliffs	3241'	Gas
Lewis	3365'	None
Huerfano Bentonite	3868'	None
Chacra	4224'	None
Cliff House	4977'	Gas
Menefee	5105'	None
Pt. Lookout	5423'	Gas
Mancos	6120'	Gas
Gallup	6705'	Gas
El Vado	6716'	Gas
Basal Niobrara	6956'	None
Juana Lopez	7093'	None
Greenhorn	7403'	None
Graneros	7464'	Gas
Dakota	7620'	Gas

3. Pressure Control Equipment

See attached BOP equipment and choke manifold schematics for a diagram of pressure control equipment.

- BOP equipment will be nipped up on top of the wellhead after surface casing is set and cemented.
- Pressure control configurations will be designed to meet the minimum 3M standards.
- All equipment will have a minimum of 3M pressure rating and will be rated for 7,000' (TVD).
- A rotating head will be installed on top of the annular as seen in the attached diagram.
- BOP Testing: The BOPE will be tested to 250 psi (Low) for 5 minutes and 3,000 psi (High) for 10 minutes. Pressure test surface casing to 600 psi for 30 minutes and intermediate casing to 1,500 psi for



Rio Arriba County, NM

San Juan 29-6 Unit 118

Hilcorp Energy Company

30 minutes. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. BOP equipment will be tested upon installation, every 30 days, and after any repairs are made to the BOP equipment. Annular preventors will be functionally tested at least once per week. Pipe and blind rams will be function tested each trip. The NMOCD and the BLM will be notified 24 hours in advance of testing BOPE. All tests and inspections will be recorded and logged with time and results. A full BOP test will be conducted if a seal subject to test pressure is broken, following related repairs, and at a minimum of 30-day intervals.

4. Casing & Cement Program

A. Proposed Casing Program:

Proposed Casing Design					
Casing String	Hole Size	Casing Size	Weight/Grade	Top Depth (MD/TVD)	Shoe Depth (MD/TVD)
Surface	12-1/4"	9-5/8"	32.3# H40 (or equiv.) STC	0'	200' / 200'
Intermediate	8-3/4"	7"	23# J55 (or equiv.) LTC	0'	3722' / 3600'
Production Casing	6-1/4"	4-1/2"	11.6# J55 (or equiv.) LTC	0'	8125' / 8000'
Proposed Casing Design Safety Factors					
Casing String	Casing Description		Burst Design SF	Collapse Design SF	Body Tensile Design SF
Surface	9-5/8" 32.3# H40 STC		1.5	14.6	56.5
Intermediate	7" 23# J55 BTC		3.4	1.7	4.3
Production	4-1/2" 11.6# J55 LTC		2.1	1.2	2.0

Notes:

- The 6-1/4" hole will be drilled through the Dakota section and TD will be called onsite by mud loggers.
- Production casing will be run from surface to TD.
- If the 6-1/4" hole is not drilled to the total planned measured depth, the production casing setting depth and length will be adjusted accordingly.
- Casing Design Parameters – Designed for full evacuation. Mud Weights used for calculations: Surface = 9.0 ppg, Intermediate = 10.0 ppg, Production = 10.0 ppg. Burst: 1.15; Collapse: 1.125; Tensile: 1.6.
 - Burst: (Casing Burst Rating) / (Maximum Burst Load (csg pressure test + MW x TVD x .052))
 - Collapse: (Full hydrostatic of MW in annulus) – (Hydrostatic of vacated casing, 0.1 psi/ft)
 - Tensile: (Tensile rating) / (measured depth x casing weight)

B. Proposed Centralizer Program:

Proposed Centralizer Program	
Interval	Centralizers & Placement
Surface	1 centralizer per joint on bottom 3 joints.
Intermediate	1 centralizer 10' above the shoe with lock collar. 1 centralizer every other joint on bottom 10 joints. 1 centralizer every 4 th joint to Ojo Alamo base. 1 Turbolizer at base of Ojo Alamo. 1 centralizer every joint to Ojo Alamo top.

Rio Arriba County, NM

San Juan 29-6 Unit 118

Hilcorp Energy Company

	1 Turbolizer placed midway through Ojo Alamo. 1 centralizer every 4 th joint from top of Ojo Alamo to surface shoe. 1 centralizer inside the surface casing.
Production (Air Drilled)	1 centralizer 10' above the shoe with a lock collar. 1 centralizer every other joint on bottom 10 joints.

C. Proposed Cement Program:

Proposed Cement Design							
Interval	Depth (ft. MD)	Lead/Tail	Volume (ft ³)	Sacks	Slurry	Density	Planned TOC
Surface	200'	Lead	125 ft ³	90	Type III Cement 0.25% FL-52, 0.25 pps celloflake 1.25 ft ³ /sk – 5.75 gal/sk	15.2 ppg	Surface
Intermediate	3,722'	Lead	762 ft ³	358	Premium Lite 3% CaCl, 0.25 pps celloflake, 5 ppm LCM-1, 0.4% FL-52, 8% bentonite, 0.4% SMS 2.13 ft ³ /sk – 11.29 gal/sk	12.1 ppg	Surface
		Tail	120 ft ³	70	Type III Cement 1% CaCl, 0.25 pps celloflake, 0.2% FL-52 1.38ft ³ /sk – 6.64 gal/sk	14.6 ppg	3,222
Production	8,125	Lead	659 ft ³	500	50/50 POZ: Class G cement + 0.25 lb/sx D029 Cellophane Flakes + 3% D020 Bentonite + 1.0 lb/sx D024 Gilsonite Extender + 0.25% D167 Fluid Loss + 0.25% D065 Dispersant + 0.1% D800 Retarder + 0.1% D046 Antifoamer + 3.5 lb/sx Phenoseal 1.44ft ³ /sk – 6.47 gal/sk	13.0 ppg	3,622'

Notes:

- The cement slurry additives may be adjusted to accommodate required pump and compressive test times.
- For the intermediate hole section, a 2-stage cement job may be performed if hole conditions dictate. If needed, the stage tool will be placed at an approximate depth near the top of the Fruitland Coal.
- Cement will be circulated to surface on surface and intermediate casing sections to protect water bearing zones.
- A minimum of 8 hours of wait on cement time will be observed on each hole section to allow adequate time for cement to achieve a minimum of 500 psi of compressive strength. The BOP will not be nipped down, the wellhead will not be installed, the casing will not be tested and the prior casing shoe will not be drilled out until adequate wait on cement time has been observed (8 hours or time to reach 500 psi compressive strength).

Rio Arriba County, NM

San Juan 29-6 Unit 118

Hilcorp Energy Company

5. Drilling Fluids Program

A. Proposed Drilling Fluids Program:

Interval	Fluid Type	Density (ppg)	Fluid Loss (mL/30 min)	Max Chlorides (mg/L)	Depth (ft. MD)
Surface	Water/Gel	8.4 – 9.2	NC	1,000	0' – 200'
Intermediate	LSND / Gel System	8.4 – 9.2	6-16	1,000	200' – 3,722'
Production	Air/mist/N2	1.0	NC	N/A	3,722' – 8,125'

Notes:

- The following equipment will be operational while gas/mist drilling:
 - o An anchored blooie line will be utilized to discharge all cuttings and circulating medium to the blow pit a minimum of 100' from the wellhead.
 - o The blooie line will be equipped with an automatic igniter or pilot light.
 - o Deduster equipment will be utilized.
 - o The rotating head will be properly lubricated and maintained.
 - o A float valve will be utilized above the bit.
 - o Mud circulating equipment, water, and mud materials will be sufficient to maintain control of the well.
- Lost circulation material may be added to the mud systems to manage fluid losses as hole conditions dictate.
- The well will be drilled utilizing a closed-loop circulating system. Drill cuttings will be transported to an approved disposal site.
- Estimated total volume of drill cuttings for disposal: 457 bbls (2,566 ft³).

6. Estimated Pressures & Drilling Hazards

A. Estimated Pressures

- The Mesa Verde and/or Dakota formations will be completed and commingled if both formations are completed.
- No abnormal temperatures or hazards are anticipated.
- Anticipated pore pressures are as follows:
 - o Fruitland Coal 400 psi
 - o Pictured Cliffs 850 psi
 - o Mesa Verde 650 psi
 - o Dakota 2200 psi

B. Water Flows

- Water flows are possible in the intermediate section. Water flows will be mitigated with increased mud weight.

C. Lost Circulation

- Lost circulation is possible in the coal section. Losses will be mitigated by adding LCM to the mud system.
- Sufficient LCM will be added to the mud system to maintain well control if lost circulation is encountered.



Rio Arriba County, NM

San Juan 29-6 Unit 118

Hilcorp Energy Company

D. Hydrogen Sulfide

- No hydrogen sulfide is expected to be encountered based on nearby well production.

7. Testing, Logging, Coring

A. Mud Logging

- Mud loggers will collect formation samples every 30' from the Intermediate casing shoe to the TD of production hole section.

B. MWD

- Measurement while drilling tools will be utilized from the surface casing shoe to the TD of the intermediate section to measure and record inclination. A wireline survey will be run after cementing the production casing to verify bottom hole position.

C. LWD

- No logging while drilling tools will be utilized.

D. Open Hole Logging

- There are no planned open hole logs post drilling.

E. Coring

- There is no coring or formation testing planned.

F. Cased Hole Logging

- The 7" intermediate casing will be cemented to surface to protect water bearing zones. If cement is not circulated to surface on the intermediate cement job, a temperature survey or a cement bod log will be run to verify top of cement.

8. Directional Drilling Plan

- The directional drilling plans and plots are attached.
- The directional plan is built from geologic targets from offset wells and lease boundaries. On-site adjustments to the directional plans will be made as formation and wellbore dictate.

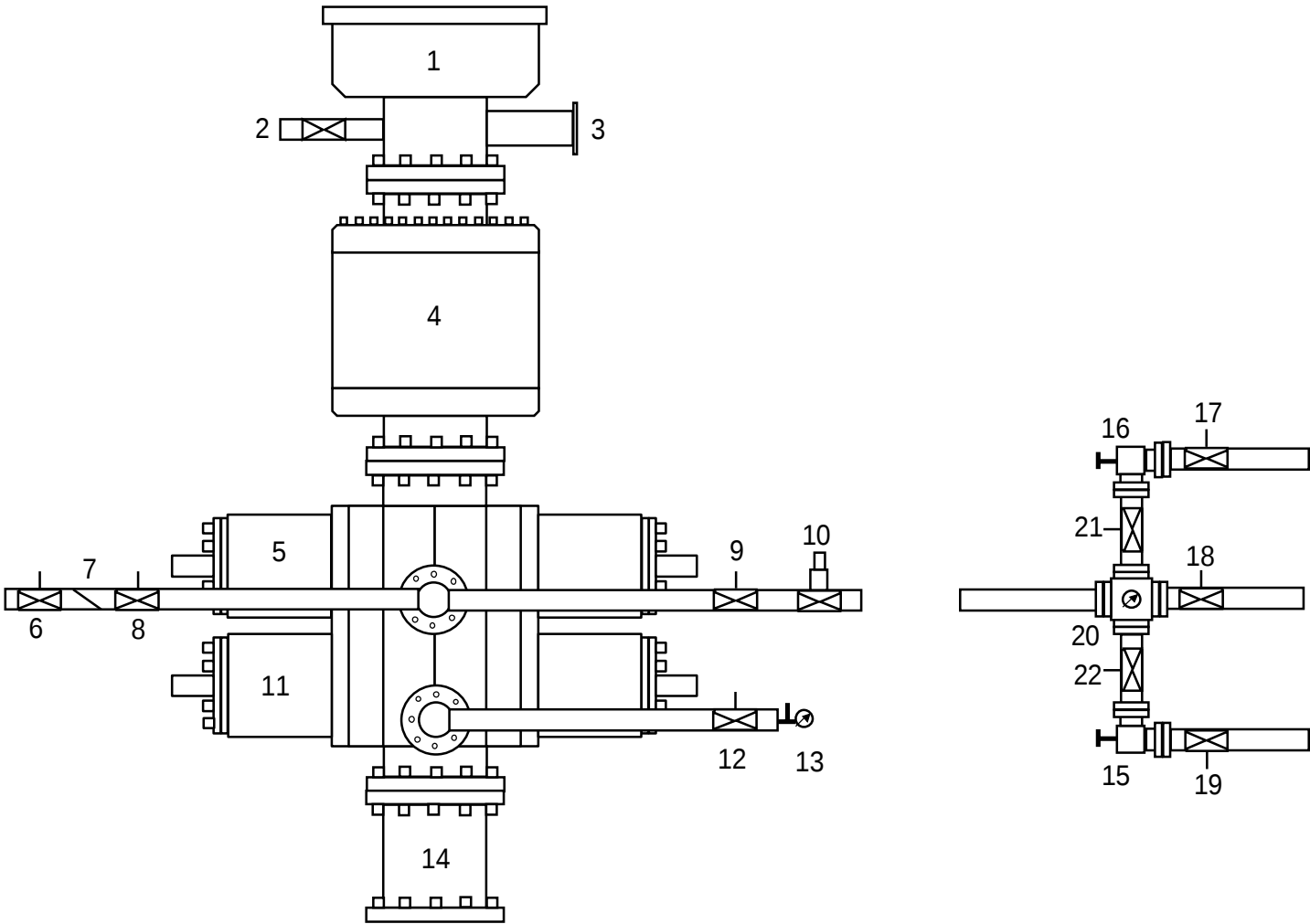
Rio Arriba County, NM

San Juan 29-6 Unit 118



Appendix A

Pressure Control Equipment Configuration



1	Rotating Head	12	Manual Isolation Valve
2	Fill Up Line	13	Needle Valve & Pressure Gauge
3	Flow Line	14	Spacer Spool (if needed)
4	3M Annular Preventer	15	Manual Choke
5	3M Pipe Rams	16	Manual Choke
6	Manual Isolation Valve	17	Manual Isolation Valve
7	Check Valve	18	Manual Isolation Valve
8	Manual Isolation Valve	19	Manual Isolation Valve
9	Manual Isolation Valve	20	Valve Block & Pressure Gauge
10	High Closing Ratio Valve	21	Manual Isolation Valve
11	3M Blind Rams	22	Manual Isolation Valve



Company: Hilcorp Energy Corp.
 Project: Rio Arriba, NM NAD27
 Site: San Juan 29-7 Unit NP 516 Pad
 Well: San Juan 29-7 Unit NP 516
 Wellbore: OH
 Design: Plan #1

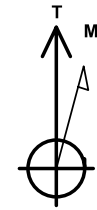


Scientific Drilling

Well Details: San Juan 29-7 Unit NP 516

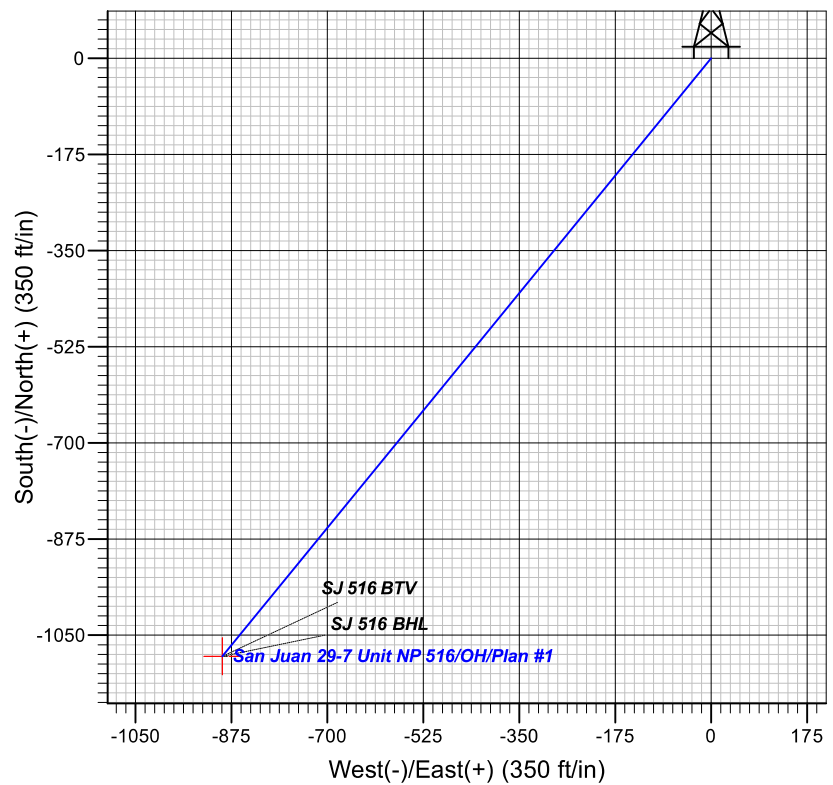
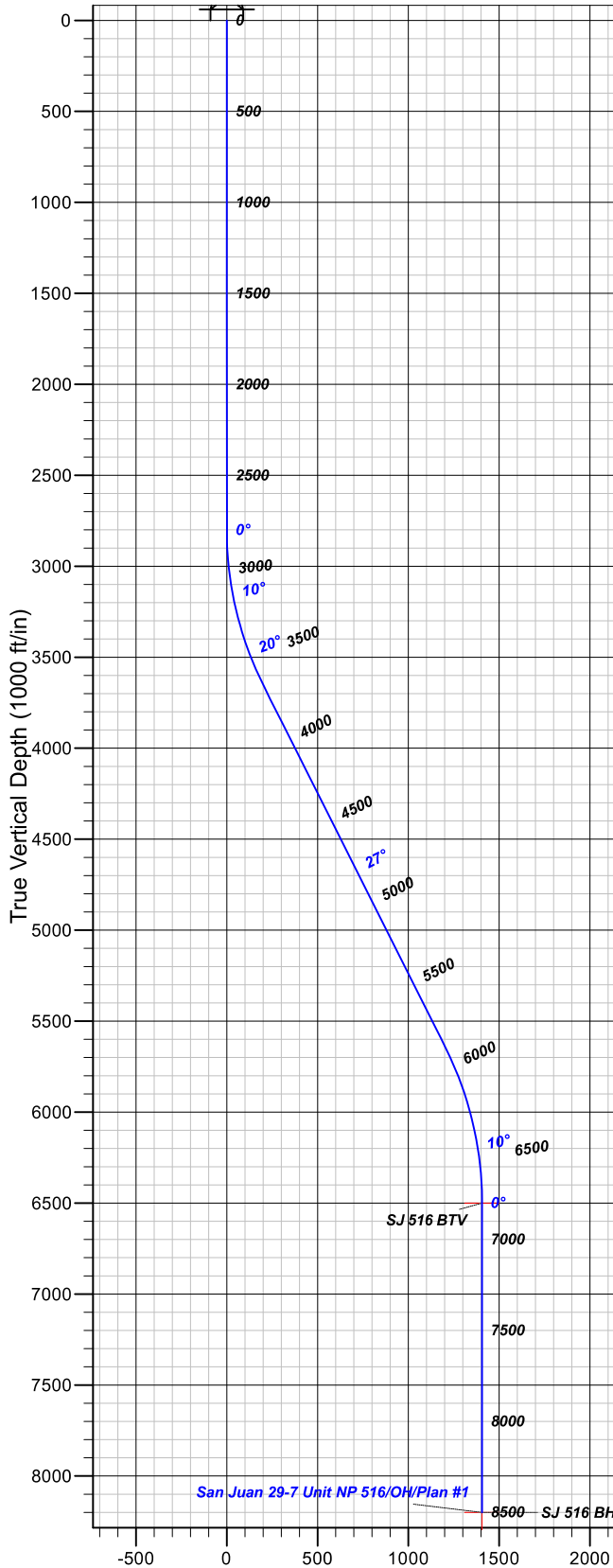
GL 6833' @ 6833.00ft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	2066816.52	590279.48	36.6797200	-107.5254600	



Azimuths to True North
 Magnetic North: 8.62°

Magnetic Field
 Strength: 49481.0nT
 Dip Angle: 63.15°
 Date: 12/31/2021
 Model: HDGM2021_FILE



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1844.00	1844.00	NACIMIENTO
2713.00	2713.00	OJO_ALAMO_TOP
2878.00	2878.02	KIRTLAND
3410.00	3420.88	FRUITLAND *
3633.00	3661.97	PICTURED_CLIFFS
4223.00	4306.88	BERNANITO_BENTONITE *
4575.00	4716.70	CHACRA
5267.00	5491.60	CLIFF_HOUSE
5420.00	5662.93	MENEFFEE
5782.00	6065.29	POINT_LOOKOUT
6472.00	6773.37	MANCOS_MKR
7026.00	7327.37	EL_VADO
7086.00	7387.37	EL_VADO_A
7167.00	7468.37	EL_VADO_B
7243.00	7544.37	EL_VADO_C
7459.00	7760.37	JUANA_LOPEZ
7748.00	8049.37	GREENHORN
7801.00	8102.37	GRANEROS
7847.00	8148.37	TWO_WELLS
7930.00	8231.37	PAUGATE
7985.00	8286.37	CUBERO_LWR
8068.00	8369.37	ENCINAL_CANYON

Plan: Plan #1

10:08, April 30 2024
 Created By: Janie Collins

PROJECT DETAILS: Rio Arriba, NM NAD27

Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico West 3003

System Datum: Mean Sea Level

CASING DETAILS

No casing data is available

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00
2800.00	0.00	0.000	2800.00	0.00	0.00	0.00	0.00	0.00
3691.50	26.75	219.318	3659.48	-158.07	-129.46	3.00	219.32	204.32
5909.87	26.75	219.318	5640.52	-930.41	-762.02	0.00	0.00	1202.63
6801.37	0.00	0.000	6500.00	-1088.48	-891.48	3.00	180.00	1406.96
8501.37	0.00	0.000	8200.00	-1088.48	-891.48	0.00	0.00	1406.96

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SJ 516 BTV	6500.00	-1088.48	-891.48	2065725.19	589391.50	36.6767300	-107.5285000
- plan hits target center							
SJ 516 BHL	8200.00	-1088.48	-891.48	2065725.19	589391.50	36.6767300	-107.5285000
- plan hits target center							

Vertical Section at 219.318° (1000 ft/in)



Hilcorp Energy Corp.

Rio Arriba, NM NAD27

San Juan 29-7 Unit NP 516 Pad

San Juan 29-7 Unit NP 516

OH

Plan: Plan #1

Standard Planning Report

30 April, 2024



www.scientificdrilling.com





Scientific Drilling Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Company:	Hilcorp Energy Corp.	TVD Reference:	GL 6833' @ 6833.00ft
Project:	Rio Arriba, NM NAD27	MD Reference:	GL 6833' @ 6833.00ft
Site:	San Juan 29-7 Unit NP 516 Pad	North Reference:	True
Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project	Rio Arriba, 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		San Juan 29-7 Unit NP 516 Pad			
Site Position:		Northing:	2,066,816.52 usft	Latitude:	36.6797200
From:	Lat/Long	Easting:	590,279.49 usft	Longitude:	-107.5254600
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in	Grid Convergence:	0.18 °

Well	San Juan 29-7 Unit NP 516					
Well Position	+N/-S	0.00 ft	Northing:	2,066,816.52 usft	Latitude:	36.6797200
	+E/-W	0.00 ft	Easting:	590,279.49 usft	Longitude:	-107.5254600
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	6,833.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2021_FILE	12/31/2021	8.62	63.15	49,481.00000000

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	219.318

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,800.00	0.00	0.000	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,691.50	26.75	219.318	3,659.48	-158.07	-129.46	3.00	3.00	0.00	219.32	
5,909.87	26.75	219.318	5,640.52	-930.41	-762.02	0.00	0.00	0.00	0.00	
6,801.37	0.00	0.000	6,500.00	-1,088.48	-891.48	3.00	-3.00	0.00	180.00	SJ 516 BTV
8,501.37	0.00	0.000	8,200.00	-1,088.48	-891.48	0.00	0.00	0.00	0.00	SJ 516 BHL



Scientific Drilling Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Company:	Hilcorp Energy Corp.	TVD Reference:	GL 6833' @ 6833.00ft
Project:	Rio Arriba, NM NAD27	MD Reference:	GL 6833' @ 6833.00ft
Site:	San Juan 29-7 Unit NP 516 Pad	North Reference:	True
Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.000	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.000	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.000	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.000	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.000	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.000	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.000	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.000	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.000	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.000	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.000	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.000	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.000	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.000	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.000	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.000	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.000	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.000	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.000	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.000	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.000	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.000	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.000	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.000	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.000	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	3.00	219.318	2,899.95	-2.02	-1.66	2.62	3.00	3.00	0.00
3,000.00	6.00	219.318	2,999.63	-8.09	-6.63	10.46	3.00	3.00	0.00
3,100.00	9.00	219.318	3,098.77	-18.19	-14.90	23.51	3.00	3.00	0.00
3,200.00	12.00	219.318	3,197.08	-32.29	-26.44	41.73	3.00	3.00	0.00
3,300.00	15.00	219.318	3,294.31	-50.35	-41.23	65.08	3.00	3.00	0.00
3,400.00	18.00	219.318	3,390.18	-72.32	-59.23	93.47	3.00	3.00	0.00
3,500.00	21.00	219.318	3,484.43	-98.14	-80.38	126.85	3.00	3.00	0.00
3,600.00	24.00	219.318	3,576.81	-127.74	-104.62	165.12	3.00	3.00	0.00
3,691.50	26.75	219.318	3,659.48	-158.07	-129.46	204.32	3.00	3.00	0.00
3,700.00	26.75	219.318	3,667.07	-161.03	-131.89	208.14	0.00	0.00	0.00
3,800.00	26.75	219.318	3,756.37	-195.84	-160.40	253.15	0.00	0.00	0.00
3,900.00	26.75	219.318	3,845.67	-230.66	-188.91	298.15	0.00	0.00	0.00
4,000.00	26.75	219.318	3,934.97	-265.48	-217.43	343.15	0.00	0.00	0.00
4,100.00	26.75	219.318	4,024.27	-300.29	-245.94	388.15	0.00	0.00	0.00
4,200.00	26.75	219.318	4,113.58	-335.11	-274.46	433.16	0.00	0.00	0.00
4,300.00	26.75	219.318	4,202.88	-369.92	-302.97	478.16	0.00	0.00	0.00
4,400.00	26.75	219.318	4,292.18	-404.74	-331.49	523.16	0.00	0.00	0.00
4,500.00	26.75	219.318	4,381.48	-439.55	-360.00	568.16	0.00	0.00	0.00
4,600.00	26.75	219.318	4,470.78	-474.37	-388.52	613.16	0.00	0.00	0.00
4,700.00	26.75	219.318	4,560.08	-509.18	-417.03	658.17	0.00	0.00	0.00
4,800.00	26.75	219.318	4,649.39	-544.00	-445.54	703.17	0.00	0.00	0.00
4,900.00	26.75	219.318	4,738.69	-578.82	-474.06	748.17	0.00	0.00	0.00
5,000.00	26.75	219.318	4,827.99	-613.63	-502.57	793.17	0.00	0.00	0.00
5,100.00	26.75	219.318	4,917.29	-648.45	-531.09	838.17	0.00	0.00	0.00
5,200.00	26.75	219.318	5,006.59	-683.26	-559.60	883.18	0.00	0.00	0.00



Scientific Drilling
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Company:	Hilcorp Energy Corp.	TVD Reference:	GL 6833' @ 6833.00ft
Project:	Rio Arriba, NM NAD27	MD Reference:	GL 6833' @ 6833.00ft
Site:	San Juan 29-7 Unit NP 516 Pad	North Reference:	True
Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,300.00	26.75	219.318	5,095.90	-718.08	-588.12	928.18	0.00	0.00	0.00	
5,400.00	26.75	219.318	5,185.20	-752.89	-616.63	973.18	0.00	0.00	0.00	
5,500.00	26.75	219.318	5,274.50	-787.71	-645.15	1,018.18	0.00	0.00	0.00	
5,600.00	26.75	219.318	5,363.80	-822.52	-673.66	1,063.19	0.00	0.00	0.00	
5,700.00	26.75	219.318	5,453.10	-857.34	-702.17	1,108.19	0.00	0.00	0.00	
5,800.00	26.75	219.318	5,542.40	-892.15	-730.69	1,153.19	0.00	0.00	0.00	
5,900.00	26.75	219.318	5,631.71	-926.97	-759.20	1,198.19	0.00	0.00	0.00	
5,909.87	26.75	219.318	5,640.52	-930.41	-762.02	1,202.63	0.00	0.00	0.00	
6,000.00	24.04	219.318	5,721.93	-960.31	-786.50	1,241.28	3.00	-3.00	0.00	
6,100.00	21.04	219.318	5,814.28	-989.96	-810.79	1,279.61	3.00	-3.00	0.00	
6,200.00	18.04	219.318	5,908.51	-1,015.83	-831.98	1,313.05	3.00	-3.00	0.00	
6,300.00	15.04	219.318	6,004.36	-1,037.86	-850.02	1,341.52	3.00	-3.00	0.00	
6,400.00	12.04	219.318	6,101.57	-1,055.97	-864.85	1,364.93	3.00	-3.00	0.00	
6,500.00	9.04	219.318	6,199.87	-1,070.12	-876.45	1,383.23	3.00	-3.00	0.00	
6,600.00	6.04	219.318	6,299.00	-1,080.27	-884.76	1,396.35	3.00	-3.00	0.00	
6,700.00	3.04	219.318	6,398.67	-1,086.40	-889.78	1,404.27	3.00	-3.00	0.00	
6,800.00	0.04	219.318	6,498.63	-1,088.48	-891.48	1,406.95	3.00	-3.00	0.00	
6,801.37	0.00	0.000	6,500.00	-1,088.48	-891.48	1,406.96	3.00	-3.00	0.00	
6,900.00	0.00	0.000	6,598.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,000.00	0.00	0.000	6,698.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,100.00	0.00	0.000	6,798.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,200.00	0.00	0.000	6,898.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,300.00	0.00	0.000	6,998.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,400.00	0.00	0.000	7,098.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,500.00	0.00	0.000	7,198.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,600.00	0.00	0.000	7,298.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,700.00	0.00	0.000	7,398.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,800.00	0.00	0.000	7,498.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
7,900.00	0.00	0.000	7,598.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,000.00	0.00	0.000	7,698.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,100.00	0.00	0.000	7,798.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,200.00	0.00	0.000	7,898.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,300.00	0.00	0.000	7,998.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,400.00	0.00	0.000	8,098.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,500.00	0.00	0.000	8,198.63	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	
8,501.37	0.00	0.000	8,200.00	-1,088.48	-891.48	1,406.96	0.00	0.00	0.00	

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
SJ 516 BTV	0.00	0.000	6,500.00	-1,088.48	-891.48	2,065,725.18	589,391.51	36.6767300	-107.5285000
- plan hits target center									
- Point									
SJ 516 BHL	0.00	0.000	8,200.00	-1,088.48	-891.48	2,065,725.18	589,391.51	36.6767300	-107.5285000
- plan hits target center									
- Point									



Scientific Drilling

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Company:	Hilcorp Energy Corp.	TVD Reference:	GL 6833' @ 6833.00ft
Project:	Rio Arriba, NM NAD27	MD Reference:	GL 6833' @ 6833.00ft
Site:	San Juan 29-7 Unit NP 516 Pad	North Reference:	True
Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,844.00	1,844.00	NACIMIENTO		0.00	0.000	
2,713.00	2,713.00	OJO_ALAMO_TOP		0.00	0.000	
2,878.02	2,878.00	KIRTLAND		0.00	0.000	
3,420.88	3,410.00	FRUITLAND *		0.00	0.000	
3,661.97	3,633.00	PICTURED_CLIFFS		0.00	0.000	
4,322.53	4,223.00	HUERFANITO_BENTONITE *		0.00	0.000	
4,716.70	4,575.00	CHACRA		0.00	0.000	
5,491.60	5,267.00	CLIFF_HOUSE		0.00	0.000	
5,662.93	5,420.00	MENEFEE		0.00	0.000	
6,065.29	5,782.00	POINT_LOOKOUT		0.00	0.000	
6,773.37	6,472.00	MANCOS_MKR		0.00	0.000	
7,327.37	7,026.00	EL_VADO		0.00	0.000	
7,387.37	7,086.00	EL_VADO_A		0.00	0.000	
7,468.37	7,167.00	EL_VADO_B		0.00	0.000	
7,544.37	7,243.00	EL_VADO_C		0.00	0.000	
7,760.37	7,459.00	JUANA_LOPEZ		0.00	0.000	
8,049.37	7,748.00	GREENHORN		0.00	0.000	
8,102.37	7,801.00	GRANEROS		0.00	0.000	
8,148.37	7,847.00	TWO_WELLS		0.00	0.000	
8,231.37	7,930.00	PAUGATE		0.00	0.000	
8,286.37	7,985.00	CUBERO_LWR		0.00	0.000	
8,369.37	8,068.00	ENCINAL_CANYON		0.00	0.000	



Hilcorp Energy Corp.

Rio Arriba, NM NAD27

San Juan 29-7 Unit NP 516 Pad

San Juan 29-7 Unit NP 516

OH

Plan #1

Anticollision Report

15 May, 2024



Scientific Drilling

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Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.00 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	5/15/2024		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	8,501.37	Plan #1 (OH)	MWD+HDGM	OWSG MWD + HDGM	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
San Juan 29-7 Unit NP 516 Pad						
San Juan 28-7 UN 055 - OH - OH	6,500.00	5,698.00	2,294.77	2,043.02	9.115	SF
San Juan 28-7 UN 055 - OH - OH	6,540.52	5,698.00	2,294.03	2,042.55	9.122	CC, ES
San Juan 28-7 UN 074A - OH - OH	6,700.00	5,990.00	2,678.14	2,413.90	10.135	CC, ES, SF
San Juan 28-7 UN 218 - OH - OH	6,880.40	6,396.03	1,844.24	1,560.06	6.490	CC
San Juan 28-7 UN 218 - OH - OH	8,400.00	7,915.63	1,844.26	1,494.88	5.279	ES, SF
San Juan 28-7 UN 218M - OH - OH	6,313.11	5,964.04	2,121.17	1,852.67	7.900	CC
San Juan 28-7 UN 218M - OH - OH	8,400.00	8,033.00	2,122.12	1,764.83	5.939	ES, SF
San Juan 29-7 UN 030A - OH - OH	6,880.40	6,351.03	2,332.14	2,047.63	8.197	CC
San Juan 29-7 UN 030A - OH - OH	8,400.00	7,843.00	2,332.32	1,984.02	6.696	ES, SF
San Juan 29-7 UN 068 - OH - OH	4,373.62	4,256.62	714.41	527.17	3.815	CC
San Juan 29-7 UN 068 - OH - OH	4,500.00	4,369.48	716.67	524.15	3.723	ES
San Juan 29-7 UN 068 - OH - OH	4,900.00	4,726.69	752.66	543.56	3.600	SF
San Juan 29-7 UN 105E - OH - OH	3,300.00	3,841.14	2,575.70	2,546.86	89.308	CC
San Juan 29-7 UN 105E - OH - OH	3,304.45	3,843.49	2,575.72	2,546.84	89.208	ES
San Juan 29-7 UN 105E - OH - OH	4,500.00	4,594.46	2,889.77	2,853.12	78.837	SF
San Juan 29-7 UN 105M - OH - OH	2,800.00	2,775.00	1,792.80	1,671.76	14.812	CC
San Juan 29-7 UN 105M - OH - OH	3,300.00	3,269.31	1,803.76	1,661.28	12.659	ES
San Juan 29-7 UN 105M - OH - OH	8,400.00	8,073.63	2,440.23	2,084.33	6.856	SF
San Juan 29-7 UN 106 - OH - OH	2,800.00	2,782.00	307.84	186.52	2.537	CC
San Juan 29-7 UN 106 - OH - OH	3,000.00	2,981.63	312.51	182.54	2.404	ES
San Juan 29-7 UN 106 - OH - OH	3,200.00	3,179.08	328.06	189.53	2.368	SF
San Juan 29-7 UN 106M - OH - OH	2,800.00	2,683.00	2,568.81	2,451.45	21.889	CC
San Juan 29-7 UN 106M - OH - OH	2,900.00	2,782.95	2,570.90	2,449.20	21.125	ES
San Juan 29-7 UN 106M - OH - OH	8,500.00	7,990.00	3,790.42	3,440.11	10.820	SF
San Juan 29-7 UN 106N - OH - OH	5,167.13	4,965.24	922.43	701.65	4.178	CC
San Juan 29-7 UN 106N - OH - OH	5,400.00	5,173.20	928.37	697.69	4.025	ES
San Juan 29-7 UN 106N - OH - OH	8,400.00	8,069.00	1,068.29	711.15	2.991	SF

Offset Design												San Juan 29-7 Unit NP 516 Pad - San Juan 28-7 UN 055 - OH - OH		Offset Site Error:		0.00 ft	
Survey Program:		100-UNKNOWN										Offset Well Error:		0.00 ft			
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	+N/-S	+E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)					
0.00	0.00	0.00	0.00	0.00	0.00	-156.69	-3,287.28	-1,416.51	3,588.92								

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
100.00	100.00	0.00	0.00	0.36	0.00	-156.69	-3,287.28	-1,416.51	3,583.06	3,582.69	0.37	9,612.709		
200.00	200.00	0.00	0.00	0.72	0.00	-156.69	-3,287.28	-1,416.51	3,579.99	3,579.27	0.72	4,985.470		
283.34	283.34	23.34	23.34	1.02	0.93	-156.69	-3,287.28	-1,416.51	3,579.49	3,577.54	1.95	1,836.309		
300.00	300.00	40.00	40.00	1.08	1.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,576.81	2.68	1,337.859		
400.00	400.00	140.00	140.00	1.43	5.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,572.45	7.03	508.892		
500.00	500.00	240.00	240.00	1.79	9.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,568.09	11.39	314.201		
600.00	600.00	340.00	340.00	2.15	13.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,563.74	15.75	227.257		
700.00	700.00	440.00	440.00	2.51	17.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,559.38	20.11	178.002		
800.00	800.00	540.00	540.00	2.87	21.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,555.02	24.47	146.294		
900.00	900.00	640.00	640.00	3.23	25.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,550.66	28.83	124.175		
1,000.00	1,000.00	740.00	740.00	3.58	29.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,546.30	33.18	107.866		
1,100.00	1,100.00	840.00	840.00	3.94	33.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,541.94	37.54	95.343		
1,200.00	1,200.00	940.00	940.00	4.30	37.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,537.59	41.90	85.426		
1,300.00	1,300.00	1,040.00	1,040.00	4.66	41.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,533.23	46.26	77.377		
1,400.00	1,400.00	1,140.00	1,140.00	5.02	45.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,528.87	50.62	70.715		
1,500.00	1,500.00	1,240.00	1,240.00	5.38	49.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,524.51	54.98	65.109		
1,600.00	1,600.00	1,340.00	1,340.00	5.74	53.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,520.15	59.34	60.326		
1,700.00	1,700.00	1,440.00	1,440.00	6.09	57.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,515.79	63.69	56.198		
1,800.00	1,800.00	1,540.00	1,540.00	6.45	61.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,511.43	68.05	52.599		
1,900.00	1,900.00	1,640.00	1,640.00	6.81	65.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,507.08	72.41	49.433		
2,000.00	2,000.00	1,740.00	1,740.00	7.17	69.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,502.72	76.77	46.626		
2,100.00	2,100.00	1,840.00	1,840.00	7.53	73.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,498.36	81.13	44.122		
2,200.00	2,200.00	1,940.00	1,940.00	7.89	77.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,494.00	85.49	41.872		
2,300.00	2,300.00	2,040.00	2,040.00	8.24	81.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,489.64	89.84	39.841		
2,400.00	2,400.00	2,140.00	2,140.00	8.60	85.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,485.28	94.20	37.997		
2,500.00	2,500.00	2,240.00	2,240.00	8.96	89.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,480.93	98.56	36.317		
2,600.00	2,600.00	2,340.00	2,340.00	9.32	93.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,476.57	102.92	34.779		
2,700.00	2,700.00	2,440.00	2,440.00	9.68	97.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,472.21	107.28	33.366		
2,800.00	2,800.00	2,540.00	2,540.00	10.04	101.60	-156.69	-3,287.28	-1,416.51	3,579.49	3,467.85	111.64	32.064		
2,900.00	2,899.95	2,639.95	2,639.95	10.38	105.60	-16.04	-3,287.28	-1,416.51	3,576.97	3,460.99	115.98	30.842		
3,000.00	2,999.63	2,739.63	2,739.63	10.71	109.59	-16.14	-3,287.28	-1,416.51	3,569.43	3,449.14	120.29	29.673		
3,100.00	3,098.77	2,838.77	2,838.77	11.04	113.55	-16.30	-3,287.28	-1,416.51	3,566.89	3,432.30	124.59	28.549		
3,200.00	3,197.08	2,937.08	2,937.08	11.37	117.48	-16.53	-3,287.28	-1,416.51	3,563.39	3,410.54	128.85	27.469		
3,300.00	3,294.31	3,034.31	3,034.31	11.72	121.37	-16.84	-3,287.28	-1,416.51	3,561.98	3,383.91	133.07	26.430		
3,400.00	3,390.18	3,130.18	3,130.18	12.08	125.21	-17.23	-3,287.28	-1,416.51	3,489.73	3,352.50	137.23	25.429		
3,500.00	3,484.43	3,224.43	3,224.43	12.46	128.98	-17.69	-3,287.28	-1,416.51	3,457.73	3,316.40	141.33	24.465		
3,600.00	3,576.81	3,316.81	3,316.81	12.87	132.67	-18.25	-3,287.28	-1,416.51	3,421.08	3,275.72	145.35	23.536		
3,700.00	3,667.07	3,407.07	3,407.07	13.31	136.28	-18.88	-3,287.28	-1,416.51	3,379.90	3,230.60	149.30	22.639		
3,800.00	3,756.37	3,496.37	3,496.37	13.79	139.85	-19.12	-3,287.28	-1,416.51	3,336.88	3,183.69	153.20	21.781		
3,900.00	3,845.67	3,585.67	3,585.67	14.29	143.43	-19.38	-3,287.28	-1,416.51	3,293.92	3,136.81	157.11	20.966		
4,000.00	3,934.97	3,674.97	3,674.97	14.82	147.00	-19.64	-3,287.28	-1,416.51	3,251.02	3,089.99	161.03	20.189		
4,100.00	4,024.27	3,764.27	3,764.27	15.37	150.57	-19.90	-3,287.28	-1,416.51	3,208.17	3,043.21	164.95	19.449		
4,200.00	4,113.58	3,853.58	3,853.58	15.94	154.14	-20.18	-3,287.28	-1,416.51	3,165.38	2,996.49	168.89	18.742		
4,300.00	4,202.88	3,942.88	3,942.88	16.53	157.72	-20.46	-3,287.28	-1,416.51	3,122.65	2,949.82	172.83	18.067		
4,400.00	4,292.18	4,032.18	4,032.18	17.14	161.29	-20.75	-3,287.28	-1,416.51	3,079.99	2,903.20	176.79	17.422		
4,500.00	4,381.48	4,121.48	4,121.48	17.76	164.86	-21.05	-3,287.28	-1,416.51	3,037.40	2,856.65	180.75	16.805		
4,600.00	4,470.78	4,210.78	4,210.78	18.39	168.43	-21.35	-3,287.28	-1,416.51	2,994.87	2,810.16	184.71	16.214		
4,700.00	4,560.08	4,300.08	4,300.08	19.04	172.00	-21.66	-3,287.28	-1,416.51	2,952.42	2,763.73	188.69	15.647		
4,800.00	4,649.39	4,389.39	4,389.39	19.69	175.58	-21.99	-3,287.28	-1,416.51	2,910.05	2,717.38	192.67	15.104		
4,900.00	4,738.69	4,478.69	4,478.69	20.36	179.15	-22.32	-3,287.28	-1,416.51	2,867.75	2,671.10	196.66	14.582		
5,000.00	4,827.99	4,567.99	4,567.99	21.03	182.72	-22.66	-3,287.28	-1,416.51	2,825.54	2,624.89	200.65	14.082		
5,100.00	4,917.29	4,657.29	4,657.29	21.71	186.29	-23.01	-3,287.28	-1,416.51	2,783.42	2,578.76	204.66	13.600		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,006.59	4,746.59	4,746.59	22.40	189.86	-23.37	-3,287.28	-1,416.51	2,741.39	2,532.72	208.67	13.138		
5,300.00	5,095.90	4,835.90	4,835.90	23.10	193.44	-23.74	-3,287.28	-1,416.51	2,699.45	2,486.77	212.68	12.692		
5,400.00	5,185.20	4,925.20	4,925.20	23.80	197.01	-24.13	-3,287.28	-1,416.51	2,657.62	2,440.91	216.71	12.264		
5,500.00	5,274.50	5,014.50	5,014.50	24.50	200.58	-24.52	-3,287.28	-1,416.51	2,615.89	2,395.15	220.74	11.851		
5,600.00	5,363.80	5,103.80	5,103.80	25.22	204.15	-24.93	-3,287.28	-1,416.51	2,574.27	2,349.49	224.78	11.452		
5,700.00	5,453.10	5,193.10	5,193.10	25.93	207.72	-25.35	-3,287.28	-1,416.51	2,532.77	2,303.94	228.83	11.069		
5,800.00	5,542.40	5,282.40	5,282.40	26.65	211.30	-25.79	-3,287.28	-1,416.51	2,491.38	2,258.50	232.88	10.698		
5,900.00	5,631.71	5,371.71	5,371.71	27.38	214.87	-26.24	-3,287.28	-1,416.51	2,450.13	2,213.19	236.94	10.341		
6,000.00	5,721.93	5,461.93	5,461.93	28.08	218.48	-26.17	-3,287.28	-1,416.51	2,410.75	2,169.71	241.04	10.001		
6,100.00	5,814.28	5,554.28	5,554.28	28.74	222.17	-26.08	-3,287.28	-1,416.51	2,375.83	2,130.62	245.22	9.689		
6,200.00	5,908.51	5,648.51	5,648.51	29.33	225.94	-26.01	-3,287.28	-1,416.51	2,345.45	2,096.00	249.45	9.402		
6,300.00	6,004.36	5,698.00	5,698.00	29.88	227.92	-25.83	-3,287.28	-1,416.51	2,320.12	2,068.22	251.91	9.210		
6,400.00	6,101.57	5,698.00	5,698.00	30.37	227.92	-25.60	-3,287.28	-1,416.51	2,302.98	2,050.90	252.07	9.136		
6,500.00	6,199.87	5,698.00	5,698.00	30.80	227.92	-25.49	-3,287.28	-1,416.51	2,294.77	2,043.02	251.75	9.115 SF		
6,540.52	6,239.96	5,698.00	5,698.00	30.96	227.92	-25.48	-3,287.28	-1,416.51	2,294.03	2,042.55	251.48	9.122 CC, ES		
6,600.00	6,299.00	5,698.00	5,698.00	31.19	227.92	-25.50	-3,287.28	-1,416.51	2,295.63	2,044.70	250.93	9.148		
6,700.00	6,398.67	5,698.00	5,698.00	31.52	227.92	-25.63	-3,287.28	-1,416.51	2,305.54	2,055.92	249.63	9.236		
6,800.00	6,498.63	5,698.00	5,698.00	31.79	227.92	-25.88	-3,287.28	-1,416.51	2,324.37	2,076.50	247.87	9.377		
6,900.00	6,598.63	5,698.00	5,698.00	32.04	227.92	-166.57	-3,287.28	-1,416.51	2,349.64	2,103.92	245.72	9.562		
7,000.00	6,698.63	5,698.00	5,698.00	32.29	227.92	-166.57	-3,287.28	-1,416.51	2,378.85	2,135.63	243.22	9.781		
7,100.00	6,798.63	5,698.00	5,698.00	32.54	227.92	-166.57	-3,287.28	-1,416.51	2,411.86	2,171.44	240.41	10.032		
7,200.00	6,898.63	5,698.00	5,698.00	32.80	227.92	-166.57	-3,287.28	-1,416.51	2,448.50	2,211.17	237.34	10.316		
7,300.00	6,998.63	5,698.00	5,698.00	33.05	227.92	-166.57	-3,287.28	-1,416.51	2,488.63	2,254.59	234.04	10.633		
7,400.00	7,098.63	5,698.00	5,698.00	33.31	227.92	-166.57	-3,287.28	-1,416.51	2,532.08	2,301.52	230.55	10.983		
7,500.00	7,198.63	5,698.00	5,698.00	33.57	227.92	-166.57	-3,287.28	-1,416.51	2,578.67	2,351.75	226.92	11.364		
7,600.00	7,298.63	5,698.00	5,698.00	33.83	227.92	-166.57	-3,287.28	-1,416.51	2,628.25	2,405.07	223.18	11.776		
7,700.00	7,398.63	5,698.00	5,698.00	34.10	227.92	-166.57	-3,287.28	-1,416.51	2,680.63	2,461.28	219.35	12.221		
7,800.00	7,498.63	5,698.00	5,698.00	34.36	227.92	-166.57	-3,287.28	-1,416.51	2,735.68	2,520.20	215.48	12.696		
7,900.00	7,598.63	5,698.00	5,698.00	34.63	227.92	-166.57	-3,287.28	-1,416.51	2,793.21	2,581.63	211.58	13.202		
8,000.00	7,698.63	5,698.00	5,698.00	34.90	227.92	-166.57	-3,287.28	-1,416.51	2,853.10	2,645.42	207.68	13.738		
8,100.00	7,798.63	5,698.00	5,698.00	35.17	227.92	-166.57	-3,287.28	-1,416.51	2,915.18	2,711.38	203.80	14.304		
8,200.00	7,898.63	5,698.00	5,698.00	35.44	227.92	-166.57	-3,287.28	-1,416.51	2,979.33	2,779.37	199.96	14.900		
8,300.00	7,998.63	5,698.00	5,698.00	35.71	227.92	-166.57	-3,287.28	-1,416.51	3,045.41	2,849.24	196.17	15.524		
8,400.00	8,098.63	5,698.00	5,698.00	35.99	227.92	-166.57	-3,287.28	-1,416.51	3,113.31	2,920.86	192.44	16.178		
8,500.00	8,198.63	5,698.00	5,698.00	36.26	227.92	-166.57	-3,287.28	-1,416.51	3,182.89	2,994.11	188.79	16.860		
8,501.37	8,200.00	5,698.00	5,698.00	36.27	227.92	-166.57	-3,287.28	-1,416.51	3,183.86	2,995.12	188.74	16.869		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-128.48	-2,508.09	-3,155.53	4,040.30					
100.00	100.00	0.00	0.00	0.36	0.00	-128.48	-2,508.09	-3,155.53	4,034.70	4,034.33	0.37	N/A		
200.00	200.00	0.00	0.00	0.72	0.00	-128.48	-2,508.09	-3,155.53	4,031.58	4,030.86	0.72	5,612.402		
300.00	300.00	24.00	24.00	1.08	0.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,028.83	2.04	1,980.217		
400.00	400.00	124.00	124.00	1.43	4.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,024.47	6.39	630.425		
500.00	500.00	224.00	224.00	1.79	8.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,020.11	10.75	374.882		
600.00	600.00	324.00	324.00	2.15	12.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,015.75	15.11	266.753		
700.00	700.00	424.00	424.00	2.51	16.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,011.39	19.47	207.037		
800.00	800.00	524.00	524.00	2.87	20.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,007.04	23.83	169.167		
900.00	900.00	624.00	624.00	3.23	24.96	-128.48	-2,508.09	-3,155.53	4,030.86	4,002.68	28.19	143.008		
1,000.00	1,000.00	724.00	724.00	3.58	28.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,998.32	32.54	123.856		
1,100.00	1,100.00	824.00	824.00	3.94	32.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,993.96	36.90	109.228		
1,200.00	1,200.00	924.00	924.00	4.30	36.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,989.60	41.26	97.690		
1,300.00	1,300.00	1,024.00	1,024.00	4.66	40.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,985.24	45.62	88.357		
1,400.00	1,400.00	1,124.00	1,124.00	5.02	44.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,980.89	49.98	80.652		
1,500.00	1,500.00	1,224.00	1,224.00	5.38	48.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,976.53	54.34	74.183		
1,600.00	1,600.00	1,324.00	1,324.00	5.74	52.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,972.17	58.70	68.674		
1,700.00	1,700.00	1,424.00	1,424.00	6.09	56.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,967.81	63.05	63.927		
1,800.00	1,800.00	1,524.00	1,524.00	6.45	60.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,963.45	67.41	59.794		
1,900.00	1,900.00	1,624.00	1,624.00	6.81	64.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,959.09	71.77	56.163		
2,000.00	2,000.00	1,724.00	1,724.00	7.17	68.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,954.73	76.13	52.948		
2,100.00	2,100.00	1,824.00	1,824.00	7.53	72.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,950.38	80.49	50.080		
2,200.00	2,200.00	1,924.00	1,924.00	7.89	76.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,946.02	84.85	47.508		
2,300.00	2,300.00	2,024.00	2,024.00	8.24	80.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,941.66	89.20	45.187		
2,400.00	2,400.00	2,124.00	2,124.00	8.60	84.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,937.30	93.56	43.082		
2,500.00	2,500.00	2,224.00	2,224.00	8.96	88.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,932.94	97.92	41.164		
2,600.00	2,600.00	2,324.00	2,324.00	9.32	92.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,928.58	102.28	39.410		
2,700.00	2,700.00	2,424.00	2,424.00	9.68	96.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,924.23	106.64	37.799		
2,800.00	2,800.00	2,524.00	2,524.00	10.04	100.96	-128.48	-2,508.09	-3,155.53	4,030.86	3,919.87	111.00	36.315		
2,900.00	2,899.95	2,623.95	2,623.95	10.38	104.96	12.23	-2,508.09	-3,155.53	4,028.31	3,912.97	115.34	34.926		
3,000.00	2,999.63	2,723.63	2,723.63	10.71	108.95	12.30	-2,508.09	-3,155.53	4,020.64	3,900.99	119.65	33.603		
3,100.00	3,098.77	2,822.77	2,822.77	11.04	112.91	12.42	-2,508.09	-3,155.53	4,007.89	3,883.94	123.94	32.336		
3,200.00	3,197.08	2,921.08	2,921.08	11.37	116.84	12.60	-2,508.09	-3,155.53	3,990.08	3,861.88	128.20	31.123		
3,300.00	3,294.31	3,018.31	3,018.31	11.72	120.73	12.83	-2,508.09	-3,155.53	3,967.28	3,834.86	132.42	29.960		
3,400.00	3,390.18	3,114.18	3,114.18	12.08	124.57	13.11	-2,508.09	-3,155.53	3,939.55	3,802.97	136.58	28.845		
3,500.00	3,484.43	3,208.43	3,208.43	12.46	128.34	13.46	-2,508.09	-3,155.53	3,906.97	3,766.30	140.67	27.774		
3,600.00	3,576.81	3,300.81	3,300.81	12.87	132.03	13.88	-2,508.09	-3,155.53	3,869.64	3,724.95	144.69	26.745		
3,700.00	3,667.07	3,391.07	3,391.07	13.31	135.64	14.34	-2,508.09	-3,155.53	3,827.68	3,679.05	148.62	25.754		
3,800.00	3,756.37	3,480.37	3,480.37	13.79	139.21	14.51	-2,508.09	-3,155.53	3,783.82	3,631.30	152.51	24.810		
3,900.00	3,845.67	3,569.67	3,569.67	14.29	142.79	14.68	-2,508.09	-3,155.53	3,739.98	3,583.57	156.41	23.911		
4,000.00	3,934.97	3,658.97	3,658.97	14.82	146.36	14.86	-2,508.09	-3,155.53	3,696.18	3,535.86	160.32	23.055		
4,100.00	4,024.27	3,748.27	3,748.27	15.37	149.93	15.04	-2,508.09	-3,155.53	3,652.40	3,488.17	164.23	22.239		
4,200.00	4,113.58	3,837.58	3,837.58	15.94	153.50	15.22	-2,508.09	-3,155.53	3,608.66	3,440.51	168.15	21.461		
4,300.00	4,202.88	3,926.88	3,926.88	16.53	157.08	15.41	-2,508.09	-3,155.53	3,564.94	3,392.86	172.08	20.717		
4,400.00	4,292.18	4,016.18	4,016.18	17.14	160.65	15.60	-2,508.09	-3,155.53	3,521.26	3,345.25	176.02	20.005		
4,500.00	4,381.48	4,105.48	4,105.48	17.76	164.22	15.80	-2,508.09	-3,155.53	3,477.62	3,297.66	179.96	19.325		
4,600.00	4,470.78	4,194.78	4,194.78	18.39	167.79	16.00	-2,508.09	-3,155.53	3,434.00	3,250.10	183.91	18.673		
4,700.00	4,560.08	4,284.08	4,284.08	19.04	171.36	16.21	-2,508.09	-3,155.53	3,390.43	3,202.57	187.86	18.048		
4,800.00	4,649.39	4,373.39	4,373.39	19.69	174.94	16.43	-2,508.09	-3,155.53	3,346.89	3,155.07	191.82	17.448		
4,900.00	4,738.69	4,462.69	4,462.69	20.36	178.51	16.64	-2,508.09	-3,155.53	3,303.39	3,107.60	195.79	16.873		
5,000.00	4,827.99	4,551.99	4,551.99	21.03	182.08	16.87	-2,508.09	-3,155.53	3,259.93	3,060.17	199.76	16.320		
5,100.00	4,917.29	4,641.29	4,641.29	21.71	185.65	17.10	-2,508.09	-3,155.53	3,216.51	3,012.78	203.73	15.788		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,006.59	4,730.59	4,730.59	22.40	189.22	17.34	-2,508.09	-3,155.53	3,173.14	2,965.43	207.71	15.277		
5,300.00	5,095.90	4,819.90	4,819.90	23.10	192.80	17.58	-2,508.09	-3,155.53	3,129.82	2,918.12	211.70	14.784		
5,400.00	5,185.20	4,909.20	4,909.20	23.80	196.37	17.83	-2,508.09	-3,155.53	3,086.54	2,870.85	215.69	14.310		
5,500.00	5,274.50	4,998.50	4,998.50	24.50	199.94	18.09	-2,508.09	-3,155.53	3,043.31	2,823.62	219.69	13.853		
5,600.00	5,363.80	5,087.80	5,087.80	25.22	203.51	18.35	-2,508.09	-3,155.53	3,000.13	2,776.44	223.69	13.412		
5,700.00	5,453.10	5,177.10	5,177.10	25.93	207.08	18.62	-2,508.09	-3,155.53	2,957.01	2,729.31	227.70	12.987		
5,800.00	5,542.40	5,266.40	5,266.40	26.65	210.66	18.90	-2,508.09	-3,155.53	2,913.95	2,682.24	231.71	12.576		
5,900.00	5,631.71	5,355.71	5,355.71	27.38	214.23	19.19	-2,508.09	-3,155.53	2,870.94	2,635.21	235.73	12.179		
6,000.00	5,721.93	5,445.93	5,445.93	28.08	217.84	19.07	-2,508.09	-3,155.53	2,829.82	2,590.04	239.78	11.802		
6,100.00	5,814.28	5,538.28	5,538.28	28.74	221.53	18.94	-2,508.09	-3,155.53	2,793.30	2,549.38	243.92	11.452		
6,200.00	5,908.51	5,632.51	5,632.51	29.33	225.30	18.84	-2,508.09	-3,155.53	2,761.47	2,513.35	248.12	11.130		
6,300.00	6,004.36	5,728.36	5,728.36	29.88	229.13	18.76	-2,508.09	-3,155.53	2,734.40	2,482.03	252.37	10.835		
6,400.00	6,101.57	5,825.57	5,825.57	30.37	233.02	18.69	-2,508.09	-3,155.53	2,712.16	2,455.50	256.66	10.567		
6,500.00	6,199.87	5,923.87	5,923.87	30.80	236.95	18.65	-2,508.09	-3,155.53	2,694.80	2,433.83	260.98	10.326		
6,600.00	6,299.00	5,990.00	5,990.00	31.19	239.60	18.59	-2,508.09	-3,155.53	2,682.56	2,418.54	264.03	10.160		
6,700.00	6,398.67	5,990.00	5,990.00	31.52	239.60	18.55	-2,508.09	-3,155.53	2,678.14	2,413.90	264.24	10.135 CC, ES, SF		
6,704.45	6,403.12	5,990.00	5,990.00	31.53	239.60	18.55	-2,508.09	-3,155.53	2,678.15	2,413.90	264.24	10.135		
6,800.00	6,498.63	5,990.00	5,990.00	31.79	239.60	18.59	-2,508.09	-3,155.53	2,682.41	2,418.34	264.07	10.158		
6,900.00	6,598.63	5,990.00	5,990.00	32.04	239.60	-122.09	-2,508.09	-3,155.53	2,692.93	2,429.40	263.53	10.219		
7,000.00	6,698.63	5,990.00	5,990.00	32.29	239.60	-122.09	-2,508.09	-3,155.53	2,707.10	2,444.45	262.64	10.307		
7,100.00	6,798.63	5,990.00	5,990.00	32.54	239.60	-122.09	-2,508.09	-3,155.53	2,724.87	2,463.44	261.43	10.423		
7,200.00	6,898.63	5,990.00	5,990.00	32.80	239.60	-122.09	-2,508.09	-3,155.53	2,746.16	2,486.26	259.90	10.566		
7,300.00	6,998.63	5,990.00	5,990.00	33.05	239.60	-122.09	-2,508.09	-3,155.53	2,770.91	2,512.83	258.08	10.736		
7,400.00	7,098.63	5,990.00	5,990.00	33.31	239.60	-122.09	-2,508.09	-3,155.53	2,799.01	2,543.01	256.00	10.934		
7,500.00	7,198.63	5,990.00	5,990.00	33.57	239.60	-122.09	-2,508.09	-3,155.53	2,830.37	2,576.69	253.68	11.157		
7,600.00	7,298.63	5,990.00	5,990.00	33.83	239.60	-122.09	-2,508.09	-3,155.53	2,864.88	2,613.74	251.14	11.408		
7,700.00	7,398.63	5,990.00	5,990.00	34.10	239.60	-122.09	-2,508.09	-3,155.53	2,902.42	2,654.02	248.41	11.684		
7,800.00	7,498.63	5,990.00	5,990.00	34.36	239.60	-122.09	-2,508.09	-3,155.53	2,942.89	2,697.38	245.51	11.987		
7,900.00	7,598.63	5,990.00	5,990.00	34.63	239.60	-122.09	-2,508.09	-3,155.53	2,986.15	2,743.68	242.47	12.315		
8,000.00	7,698.63	5,990.00	5,990.00	34.90	239.60	-122.09	-2,508.09	-3,155.53	3,032.10	2,792.77	239.33	12.669		
8,100.00	7,798.63	5,990.00	5,990.00	35.17	239.60	-122.09	-2,508.09	-3,155.53	3,080.61	2,844.53	236.08	13.049		
8,200.00	7,898.63	5,990.00	5,990.00	35.44	239.60	-122.09	-2,508.09	-3,155.53	3,131.56	2,898.79	232.77	13.453		
8,300.00	7,998.63	5,990.00	5,990.00	35.71	239.60	-122.09	-2,508.09	-3,155.53	3,184.84	2,955.43	229.41	13.883		
8,400.00	8,098.63	5,990.00	5,990.00	35.99	239.60	-122.09	-2,508.09	-3,155.53	3,240.33	3,014.31	226.01	14.337		
8,500.00	8,198.63	5,990.00	5,990.00	36.26	239.60	-122.09	-2,508.09	-3,155.53	3,297.92	3,075.31	222.60	14.815		
8,501.37	8,200.00	5,990.00	5,990.00	36.27	239.60	-122.09	-2,508.09	-3,155.53	3,298.72	3,076.17	222.56	14.822		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-165.72	-2,926.91	-744.91	3,025.75					
100.00	100.00	0.00	0.00	0.36	0.00	-165.72	-2,926.91	-744.91	3,021.35	3,020.98	0.36	8,299.024		
200.00	200.00	17.00	17.00	0.72	0.68	-165.72	-2,926.91	-744.91	3,020.21	3,018.81	1.40	2,161.756		
300.00	300.00	117.00	117.00	1.08	4.68	-165.72	-2,926.91	-744.91	3,020.21	3,014.45	5.76	524.759		
400.00	400.00	217.00	217.00	1.43	8.68	-165.72	-2,926.91	-744.91	3,020.21	3,010.09	10.11	298.620		
500.00	500.00	317.00	317.00	1.79	12.68	-165.72	-2,926.91	-744.91	3,020.21	3,005.74	14.47	208.688		
600.00	600.00	417.00	417.00	2.15	16.68	-165.72	-2,926.91	-744.91	3,020.21	3,001.38	18.83	160.386		
700.00	700.00	517.00	517.00	2.51	20.68	-165.72	-2,926.91	-744.91	3,020.21	2,997.02	23.19	130.241		
800.00	800.00	617.00	617.00	2.87	24.68	-165.72	-2,926.91	-744.91	3,020.21	2,992.66	27.55	109.635		
900.00	900.00	717.00	717.00	3.23	28.68	-165.72	-2,926.91	-744.91	3,020.21	2,988.30	31.91	94.659		
1,000.00	1,000.00	817.00	817.00	3.58	32.68	-165.72	-2,926.91	-744.91	3,020.21	2,983.94	36.26	83.282		
1,100.00	1,100.00	917.00	917.00	3.94	36.68	-165.72	-2,926.91	-744.91	3,020.21	2,979.59	40.62	74.347		
1,200.00	1,200.00	1,017.00	1,017.00	4.30	40.68	-165.72	-2,926.91	-744.91	3,020.21	2,975.23	44.98	67.143		
1,300.00	1,300.00	1,117.00	1,117.00	4.66	44.68	-165.72	-2,926.91	-744.91	3,020.21	2,970.87	49.34	61.212		
1,400.00	1,400.00	1,217.00	1,217.00	5.02	48.68	-165.72	-2,926.91	-744.91	3,020.21	2,966.51	53.70	56.244		
1,500.00	1,500.00	1,317.00	1,317.00	5.38	52.68	-165.72	-2,926.91	-744.91	3,020.21	2,962.15	58.06	52.021		
1,600.00	1,600.00	1,417.00	1,417.00	5.74	56.68	-165.72	-2,926.91	-744.91	3,020.21	2,957.79	62.42	48.389		
1,700.00	1,700.00	1,517.00	1,517.00	6.09	60.68	-165.72	-2,926.91	-744.91	3,020.21	2,953.43	66.77	45.230		
1,800.00	1,800.00	1,617.00	1,617.00	6.45	64.68	-165.72	-2,926.91	-744.91	3,020.21	2,949.08	71.13	42.459		
1,900.00	1,900.00	1,717.00	1,717.00	6.81	68.68	-165.72	-2,926.91	-744.91	3,020.21	2,944.72	75.49	40.008		
2,000.00	2,000.00	1,817.00	1,817.00	7.17	72.68	-165.72	-2,926.91	-744.91	3,020.21	2,940.36	79.85	37.824		
2,100.00	2,100.00	1,917.00	1,917.00	7.53	76.68	-165.72	-2,926.91	-744.91	3,020.21	2,936.00	84.21	35.866		
2,200.00	2,200.00	2,017.00	2,017.00	7.89	80.68	-165.72	-2,926.91	-744.91	3,020.21	2,931.64	88.57	34.101		
2,300.00	2,300.00	2,117.00	2,117.00	8.24	84.68	-165.72	-2,926.91	-744.91	3,020.21	2,927.28	92.92	32.502		
2,400.00	2,400.00	2,217.00	2,217.00	8.60	88.68	-165.72	-2,926.91	-744.91	3,020.21	2,922.93	97.28	31.045		
2,500.00	2,500.00	2,317.00	2,317.00	8.96	92.68	-165.72	-2,926.91	-744.91	3,020.21	2,918.57	101.64	29.714		
2,600.00	2,600.00	2,417.00	2,417.00	9.32	96.68	-165.72	-2,926.91	-744.91	3,020.21	2,914.21	106.00	28.492		
2,700.00	2,700.00	2,517.00	2,517.00	9.68	100.68	-165.72	-2,926.91	-744.91	3,020.21	2,909.85	110.36	27.367		
2,800.00	2,800.00	2,617.00	2,617.00	10.04	104.68	-165.72	-2,926.91	-744.91	3,020.21	2,905.49	114.72	26.327		
2,900.00	2,899.95	2,716.95	2,716.95	10.38	108.68	-25.09	-2,926.91	-744.91	3,017.84	2,898.78	119.06	25.348		
3,000.00	2,999.63	2,816.63	2,816.63	10.71	112.67	-25.24	-2,926.91	-744.91	3,010.73	2,887.36	123.37	24.403		
3,100.00	3,098.77	2,915.77	2,915.77	11.04	116.63	-25.50	-2,926.91	-744.91	2,998.92	2,871.25	127.67	23.490		
3,200.00	3,197.08	3,014.08	3,014.08	11.37	120.56	-25.87	-2,926.91	-744.91	2,982.45	2,850.52	131.93	22.606		
3,300.00	3,294.31	3,111.31	3,111.31	11.72	124.45	-26.35	-2,926.91	-744.91	2,961.38	2,825.22	136.15	21.750		
3,400.00	3,390.18	3,207.18	3,207.18	12.08	128.29	-26.96	-2,926.91	-744.91	2,935.79	2,795.46	140.32	20.922		
3,500.00	3,484.43	3,301.43	3,301.43	12.46	132.06	-27.69	-2,926.91	-744.91	2,905.77	2,761.35	144.43	20.119		
3,600.00	3,576.81	3,393.81	3,393.81	12.87	135.75	-28.55	-2,926.91	-744.91	2,871.46	2,723.00	148.46	19.341		
3,700.00	3,667.07	3,484.07	3,484.07	13.31	139.36	-29.52	-2,926.91	-744.91	2,833.00	2,680.57	152.42	18.586		
3,800.00	3,756.37	3,573.37	3,573.37	13.79	142.93	-29.96	-2,926.91	-744.91	2,792.91	2,636.56	156.35	17.864		
3,900.00	3,845.67	3,662.67	3,662.67	14.29	146.51	-30.42	-2,926.91	-744.91	2,752.97	2,592.69	160.28	17.176		
4,000.00	3,934.97	3,751.97	3,751.97	14.82	150.08	-30.88	-2,926.91	-744.91	2,713.20	2,548.96	164.23	16.520		
4,100.00	4,024.27	3,841.27	3,841.27	15.37	153.65	-31.37	-2,926.91	-744.91	2,673.59	2,505.39	168.20	15.896		
4,200.00	4,113.58	3,930.58	3,930.58	15.94	157.22	-31.86	-2,926.91	-744.91	2,634.15	2,461.98	172.17	15.299		
4,300.00	4,202.88	4,019.88	4,019.88	16.53	160.80	-32.37	-2,926.91	-744.91	2,594.89	2,418.73	176.16	14.730		
4,400.00	4,292.18	4,109.18	4,109.18	17.14	164.37	-32.89	-2,926.91	-744.91	2,555.83	2,375.66	180.16	14.186		
4,500.00	4,381.48	4,198.48	4,198.48	17.76	167.94	-33.43	-2,926.91	-744.91	2,516.96	2,332.78	184.17	13.666		
4,600.00	4,470.78	4,287.78	4,287.78	18.39	171.51	-33.99	-2,926.91	-744.91	2,478.30	2,290.10	188.20	13.168		
4,700.00	4,560.08	4,377.08	4,377.08	19.04	175.08	-34.56	-2,926.91	-744.91	2,439.85	2,247.61	192.24	12.692		
4,800.00	4,649.39	4,466.39	4,466.39	19.69	178.66	-35.15	-2,926.91	-744.91	2,401.64	2,205.35	196.29	12.235		
4,900.00	4,738.69	4,555.69	4,555.69	20.36	182.23	-35.75	-2,926.91	-744.91	2,363.66	2,163.31	200.35	11.798		
5,000.00	4,827.99	4,644.99	4,644.99	21.03	185.80	-36.38	-2,926.91	-744.91	2,325.93	2,121.51	204.43	11.378		
5,100.00	4,917.29	4,734.29	4,734.29	21.71	189.37	-37.02	-2,926.91	-744.91	2,288.47	2,079.95	208.51	10.975		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,006.59	4,823.59	4,823.59	22.40	192.94	-37.68	-2,926.91	-744.91	2,251.28	2,038.67	212.62	10.588		
5,300.00	5,095.90	4,912.90	4,912.90	23.10	196.52	-38.37	-2,926.91	-744.91	2,214.39	1,997.65	216.73	10.217		
5,400.00	5,185.20	5,002.20	5,002.20	23.80	200.09	-39.07	-2,926.91	-744.91	2,177.79	1,956.93	220.86	9.861		
5,500.00	5,274.50	5,091.50	5,091.50	24.50	203.66	-39.80	-2,926.91	-744.91	2,141.52	1,916.52	225.00	9.518		
5,600.00	5,363.80	5,180.80	5,180.80	25.22	207.23	-40.55	-2,926.91	-744.91	2,105.59	1,876.43	229.16	9.188		
5,700.00	5,453.10	5,270.10	5,270.10	25.93	210.80	-41.32	-2,926.91	-744.91	2,070.01	1,836.68	233.33	8.872		
5,800.00	5,542.40	5,359.40	5,359.40	26.65	214.38	-42.12	-2,926.91	-744.91	2,034.80	1,797.29	237.52	8.567		
5,900.00	5,631.71	5,448.71	5,448.71	27.38	217.95	-42.94	-2,926.91	-744.91	1,999.99	1,758.27	241.72	8.274		
6,000.00	5,721.93	5,538.93	5,538.93	28.08	221.56	-43.11	-2,926.91	-744.91	1,967.04	1,721.08	245.96	7.998		
6,100.00	5,814.28	5,631.28	5,631.28	28.74	225.25	-43.23	-2,926.91	-744.91	1,938.07	1,687.81	250.25	7.744		
6,200.00	5,908.51	5,725.51	5,725.51	29.33	229.02	-43.37	-2,926.91	-744.91	1,913.06	1,658.46	254.59	7.514		
6,300.00	6,004.36	5,821.36	5,821.36	29.88	232.85	-43.50	-2,926.91	-744.91	1,891.97	1,633.01	258.96	7.306		
6,400.00	6,101.57	5,918.57	5,918.57	30.37	236.74	-43.62	-2,926.91	-744.91	1,874.78	1,611.43	263.35	7.119		
6,500.00	6,199.87	6,016.87	6,016.87	30.80	240.67	-43.73	-2,926.91	-744.91	1,861.44	1,593.71	267.73	6.953		
6,600.00	6,299.00	6,116.00	6,116.00	31.19	244.64	-43.81	-2,926.91	-744.91	1,851.92	1,579.83	272.09	6.806		
6,700.00	6,398.67	6,215.67	6,215.67	31.52	248.63	-43.86	-2,926.91	-744.91	1,846.20	1,569.77	276.43	6.679		
6,800.00	6,498.63	6,315.63	6,315.63	31.79	252.63	-43.88	-2,926.91	-744.91	1,844.26	1,563.53	280.74	6.569		
6,880.40	6,579.03	6,396.03	6,396.03	31.99	255.84	-43.88	-2,926.91	-744.91	1,844.24	1,560.06	284.18	6.490 CC		
6,900.00	6,598.63	6,415.63	6,415.63	32.04	256.63	175.44	-2,926.91	-744.91	1,844.26	1,559.25	285.01	6.471		
7,000.00	6,698.63	6,515.63	6,515.63	32.29	260.63	175.44	-2,926.91	-744.91	1,844.26	1,554.97	289.30	6.375		
7,100.00	6,798.63	6,615.63	6,615.63	32.54	264.63	175.44	-2,926.91	-744.91	1,844.26	1,550.68	293.58	6.282		
7,200.00	6,898.63	6,715.63	6,715.63	32.80	268.63	175.44	-2,926.91	-744.91	1,844.26	1,546.40	297.86	6.192		
7,300.00	6,998.63	6,815.63	6,815.63	33.05	272.63	175.44	-2,926.91	-744.91	1,844.26	1,542.11	302.15	6.104		
7,400.00	7,098.63	6,915.63	6,915.63	33.31	276.63	175.44	-2,926.91	-744.91	1,844.26	1,537.83	306.43	6.018		
7,500.00	7,198.63	7,015.63	7,015.63	33.57	280.63	175.44	-2,926.91	-744.91	1,844.26	1,533.54	310.72	5.935		
7,600.00	7,298.63	7,115.63	7,115.63	33.83	284.63	175.44	-2,926.91	-744.91	1,844.26	1,529.25	315.01	5.855		
7,700.00	7,398.63	7,215.63	7,215.63	34.10	288.63	175.44	-2,926.91	-744.91	1,844.26	1,524.96	319.31	5.776		
7,800.00	7,498.63	7,315.63	7,315.63	34.36	292.63	175.44	-2,926.91	-744.91	1,844.26	1,520.66	323.60	5.699		
7,900.00	7,598.63	7,415.63	7,415.63	34.63	296.63	175.44	-2,926.91	-744.91	1,844.26	1,516.37	327.89	5.625		
8,000.00	7,698.63	7,515.63	7,515.63	34.90	300.63	175.44	-2,926.91	-744.91	1,844.26	1,512.07	332.19	5.552		
8,100.00	7,798.63	7,615.63	7,615.63	35.17	304.63	175.44	-2,926.91	-744.91	1,844.26	1,507.77	336.49	5.481		
8,200.00	7,898.63	7,715.63	7,715.63	35.44	308.63	175.44	-2,926.91	-744.91	1,844.26	1,503.48	340.78	5.412		
8,300.00	7,998.63	7,815.63	7,815.63	35.71	312.63	175.44	-2,926.91	-744.91	1,844.26	1,499.18	345.08	5.344		
8,400.00	8,098.63	7,915.63	7,915.63	35.99	316.63	175.44	-2,926.91	-744.91	1,844.26	1,494.88	349.39	5.279 ES, SF		
8,500.00	8,198.63	7,919.00	7,919.00	36.26	316.76	175.44	-2,926.91	-744.91	1,846.79	1,497.29	349.50	5.284		
8,501.37	8,200.00	7,919.00	7,919.00	36.27	316.76	175.44	-2,926.91	-744.91	1,846.86	1,497.37	349.49	5.284		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	161.69	-2,384.48	788.88	2,512.15					
100.00	100.00	47.00	47.00	0.36	1.88	161.69	-2,384.48	788.88	2,511.59	2,509.35	2.24	1,121.957		
200.00	200.00	147.00	147.00	0.72	5.88	161.69	-2,384.48	788.88	2,511.59	2,504.99	6.60	380.720		
300.00	300.00	247.00	247.00	1.08	9.88	161.69	-2,384.48	788.88	2,511.59	2,500.63	10.96	229.255		
400.00	400.00	347.00	347.00	1.43	13.88	161.69	-2,384.48	788.88	2,511.59	2,496.27	15.31	164.007		
500.00	500.00	447.00	447.00	1.79	17.88	161.69	-2,384.48	788.88	2,511.59	2,491.92	19.67	127.671		
600.00	600.00	547.00	547.00	2.15	21.88	161.69	-2,384.48	788.88	2,511.59	2,487.56	24.03	104.515		
700.00	700.00	647.00	647.00	2.51	25.88	161.69	-2,384.48	788.88	2,511.59	2,483.20	28.39	88.470		
800.00	800.00	747.00	747.00	2.87	29.88	161.69	-2,384.48	788.88	2,511.59	2,478.84	32.75	76.695		
900.00	900.00	847.00	847.00	3.23	33.88	161.69	-2,384.48	788.88	2,511.59	2,474.48	37.11	67.686		
1,000.00	1,000.00	947.00	947.00	3.58	37.88	161.69	-2,384.48	788.88	2,511.59	2,470.12	41.46	60.572		
1,100.00	1,100.00	1,047.00	1,047.00	3.94	41.88	161.69	-2,384.48	788.88	2,511.59	2,465.76	45.82	54.810		
1,200.00	1,200.00	1,147.00	1,147.00	4.30	45.88	161.69	-2,384.48	788.88	2,511.59	2,461.41	50.18	50.050		
1,300.00	1,300.00	1,247.00	1,247.00	4.66	49.88	161.69	-2,384.48	788.88	2,511.59	2,457.05	54.54	46.050		
1,400.00	1,400.00	1,347.00	1,347.00	5.02	53.88	161.69	-2,384.48	788.88	2,511.59	2,452.69	58.90	42.643		
1,500.00	1,500.00	1,447.00	1,447.00	5.38	57.88	161.69	-2,384.48	788.88	2,511.59	2,448.33	63.26	39.704		
1,600.00	1,600.00	1,547.00	1,547.00	5.74	61.88	161.69	-2,384.48	788.88	2,511.59	2,443.97	67.62	37.145		
1,700.00	1,700.00	1,647.00	1,647.00	6.09	65.88	161.69	-2,384.48	788.88	2,511.59	2,439.61	71.97	34.896		
1,800.00	1,800.00	1,747.00	1,747.00	6.45	69.88	161.69	-2,384.48	788.88	2,511.59	2,435.26	76.33	32.903		
1,900.00	1,900.00	1,847.00	1,847.00	6.81	73.88	161.69	-2,384.48	788.88	2,511.59	2,430.90	80.69	31.126		
2,000.00	2,000.00	1,947.00	1,947.00	7.17	77.88	161.69	-2,384.48	788.88	2,511.59	2,426.54	85.05	29.531		
2,100.00	2,100.00	2,047.00	2,047.00	7.53	81.88	161.69	-2,384.48	788.88	2,511.59	2,422.18	89.41	28.091		
2,200.00	2,200.00	2,147.00	2,147.00	7.89	85.88	161.69	-2,384.48	788.88	2,511.59	2,417.82	93.77	26.786		
2,300.00	2,300.00	2,247.00	2,247.00	8.24	89.88	161.69	-2,384.48	788.88	2,511.59	2,413.46	98.12	25.596		
2,400.00	2,400.00	2,347.00	2,347.00	8.60	93.88	161.69	-2,384.48	788.88	2,511.59	2,409.10	102.48	24.507		
2,500.00	2,500.00	2,447.00	2,447.00	8.96	97.88	161.69	-2,384.48	788.88	2,511.59	2,404.75	106.84	23.508		
2,600.00	2,600.00	2,547.00	2,547.00	9.32	101.88	161.69	-2,384.48	788.88	2,511.59	2,400.39	111.20	22.586		
2,700.00	2,700.00	2,647.00	2,647.00	9.68	105.88	161.69	-2,384.48	788.88	2,511.59	2,396.03	115.56	21.734		
2,800.00	2,800.00	2,747.00	2,747.00	10.04	109.88	161.69	-2,384.48	788.88	2,511.59	2,391.67	119.92	20.944		
2,900.00	2,899.95	2,846.95	2,846.95	10.38	113.88	-57.71	-2,384.48	788.88	2,510.19	2,385.93	124.26	20.201		
3,000.00	2,999.63	2,946.63	2,946.63	10.71	117.87	-57.97	-2,384.48	788.88	2,506.00	2,377.43	128.57	19.491		
3,100.00	3,098.77	3,045.77	3,045.77	11.04	121.83	-58.40	-2,384.48	788.88	2,499.08	2,366.21	132.87	18.809		
3,200.00	3,197.08	3,144.08	3,144.08	11.37	125.76	-59.00	-2,384.48	788.88	2,489.49	2,352.35	137.14	18.153		
3,300.00	3,294.31	3,241.31	3,241.31	11.72	129.65	-59.77	-2,384.48	788.88	2,477.35	2,335.98	141.37	17.524		
3,400.00	3,390.18	3,337.18	3,337.18	12.08	133.49	-60.70	-2,384.48	788.88	2,462.80	2,317.24	145.56	16.920		
3,500.00	3,484.43	3,431.43	3,431.43	12.46	137.26	-61.80	-2,384.48	788.88	2,446.01	2,296.31	149.70	16.340		
3,600.00	3,576.81	3,523.81	3,523.81	12.87	140.95	-63.06	-2,384.48	788.88	2,427.18	2,273.40	153.78	15.783		
3,700.00	3,667.07	3,614.07	3,614.07	13.31	144.56	-64.43	-2,384.48	788.88	2,406.56	2,248.75	157.82	15.249		
3,800.00	3,756.37	3,703.37	3,703.37	13.79	148.13	-65.32	-2,384.48	788.88	2,385.63	2,223.80	161.84	14.741		
3,900.00	3,845.67	3,792.67	3,792.67	14.29	151.71	-66.22	-2,384.48	788.88	2,365.38	2,199.49	165.89	14.259		
4,000.00	3,934.97	3,881.97	3,881.97	14.82	155.28	-67.13	-2,384.48	788.88	2,345.81	2,175.85	169.96	13.802		
4,100.00	4,024.27	3,971.27	3,971.27	15.37	158.85	-68.06	-2,384.48	788.88	2,326.95	2,152.89	174.06	13.368		
4,200.00	4,113.58	4,060.58	4,060.58	15.94	162.42	-69.00	-2,384.48	788.88	2,308.81	2,130.62	178.19	12.957		
4,300.00	4,202.88	4,149.88	4,149.88	16.53	166.00	-69.95	-2,384.48	788.88	2,291.41	2,109.08	182.33	12.567		
4,400.00	4,292.18	4,239.18	4,239.18	17.14	169.57	-70.92	-2,384.48	788.88	2,274.77	2,088.28	186.50	12.197		
4,500.00	4,381.48	4,328.48	4,328.48	17.76	173.14	-71.89	-2,384.48	788.88	2,258.91	2,068.22	190.68	11.846		
4,600.00	4,470.78	4,417.78	4,417.78	18.39	176.71	-72.88	-2,384.48	788.88	2,243.83	2,048.95	194.88	11.514		
4,700.00	4,560.08	4,507.08	4,507.08	19.04	180.28	-73.88	-2,384.48	788.88	2,229.56	2,030.46	199.10	11.198		
4,800.00	4,649.39	4,596.39	4,596.39	19.69	183.86	-74.88	-2,384.48	788.88	2,216.11	2,012.78	203.33	10.899		
4,900.00	4,738.69	4,685.69	4,685.69	20.36	187.43	-75.90	-2,384.48	788.88	2,203.50	1,995.92	207.58	10.615		
5,000.00	4,827.99	4,774.99	4,774.99	21.03	191.00	-76.92	-2,384.48	788.88	2,191.75	1,979.91	211.84	10.346		
5,100.00	4,917.29	4,864.29	4,864.29	21.71	194.57	-77.96	-2,384.48	788.88	2,180.85	1,964.75	216.11	10.092		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,200.00	5,006.59	4,953.59	4,953.59	22.40	198.14	-79.00	-2,384.48	788.88	2,170.84	1,950.45	220.39	9.850	
5,300.00	5,095.90	5,042.90	5,042.90	23.10	201.72	-80.05	-2,384.48	788.88	2,161.71	1,937.04	224.67	9.622	
5,400.00	5,185.20	5,132.20	5,132.20	23.80	205.29	-81.11	-2,384.48	788.88	2,153.49	1,924.53	228.97	9.405	
5,500.00	5,274.50	5,221.50	5,221.50	24.50	208.86	-82.17	-2,384.48	788.88	2,146.18	1,912.92	233.27	9.201	
5,600.00	5,363.80	5,310.80	5,310.80	25.22	212.43	-83.24	-2,384.48	788.88	2,139.80	1,902.22	237.57	9.007	
5,700.00	5,453.10	5,400.10	5,400.10	25.93	216.00	-84.31	-2,384.48	788.88	2,134.34	1,892.46	241.88	8.824	
5,800.00	5,542.40	5,489.40	5,489.40	26.65	219.58	-85.39	-2,384.48	788.88	2,129.82	1,883.63	246.19	8.651	
5,900.00	5,631.71	5,578.71	5,578.71	27.38	223.15	-86.47	-2,384.48	788.88	2,126.24	1,875.74	250.50	8.488	
6,000.00	5,721.93	5,668.93	5,668.93	28.08	226.76	-87.45	-2,384.48	788.88	2,123.70	1,868.87	254.83	8.334	
6,100.00	5,814.28	5,761.28	5,761.28	28.74	230.45	-88.35	-2,384.48	788.88	2,122.18	1,862.99	259.18	8.188	
6,200.00	5,908.51	5,855.51	5,855.51	29.33	234.22	-89.18	-2,384.48	788.88	2,121.41	1,857.86	263.55	8.049	
6,300.00	6,004.36	5,951.36	5,951.36	29.88	238.05	-89.91	-2,384.48	788.88	2,121.17	1,853.24	267.93	7.917	
6,313.11	6,017.04	5,964.04	5,964.04	29.94	238.56	-90.00	-2,384.48	788.88	2,121.17	1,852.67	268.50	7.900 CC	
6,400.00	6,101.57	6,048.57	6,048.57	30.37	241.94	-90.53	-2,384.48	788.88	2,121.27	1,848.96	272.31	7.790	
6,500.00	6,199.87	6,146.87	6,146.87	30.80	245.87	-91.02	-2,384.48	788.88	2,121.52	1,844.84	276.68	7.668	
6,600.00	6,299.00	6,246.00	6,246.00	31.19	249.84	-91.38	-2,384.48	788.88	2,121.80	1,840.78	281.02	7.550	
6,700.00	6,398.67	6,345.67	6,345.67	31.52	253.83	-91.60	-2,384.48	788.88	2,122.00	1,836.67	285.34	7.437	
6,800.00	6,498.63	6,445.63	6,445.63	31.79	257.83	-91.68	-2,384.48	788.88	2,122.08	1,832.47	289.61	7.327	
6,900.00	6,598.63	6,545.63	6,545.63	32.04	261.83	-127.64	-2,384.48	788.88	2,122.08	1,828.22	293.86	7.221	
7,000.00	6,698.63	6,645.63	6,645.63	32.29	265.83	-127.64	-2,384.48	788.88	2,122.08	1,823.97	298.11	7.118	
7,100.00	6,798.63	6,745.63	6,745.63	32.54	269.83	-127.64	-2,384.48	788.88	2,122.08	1,819.72	302.36	7.018	
7,200.00	6,898.63	6,845.63	6,845.63	32.80	273.83	-127.64	-2,384.48	788.88	2,122.08	1,815.46	306.62	6.921	
7,300.00	6,998.63	6,945.63	6,945.63	33.05	277.83	-127.64	-2,384.48	788.88	2,122.08	1,811.21	310.87	6.826	
7,400.00	7,098.63	7,045.63	7,045.63	33.31	281.83	-127.64	-2,384.48	788.88	2,122.08	1,806.95	315.13	6.734	
7,500.00	7,198.63	7,145.63	7,145.63	33.57	285.83	-127.64	-2,384.48	788.88	2,122.08	1,802.69	319.39	6.644	
7,600.00	7,298.63	7,245.63	7,245.63	33.83	289.83	-127.64	-2,384.48	788.88	2,122.08	1,798.43	323.65	6.557	
7,700.00	7,398.63	7,345.63	7,345.63	34.10	293.83	-127.64	-2,384.48	788.88	2,122.08	1,794.16	327.92	6.471	
7,800.00	7,498.63	7,445.63	7,445.63	34.36	297.83	-127.64	-2,384.48	788.88	2,122.08	1,789.90	332.18	6.388	
7,900.00	7,598.63	7,545.63	7,545.63	34.63	301.83	-127.64	-2,384.48	788.88	2,122.08	1,785.63	336.45	6.307	
8,000.00	7,698.63	7,645.63	7,645.63	34.90	305.83	-127.64	-2,384.48	788.88	2,122.08	1,781.36	340.72	6.228	
8,100.00	7,798.63	7,745.63	7,745.63	35.17	309.83	-127.64	-2,384.48	788.88	2,122.08	1,777.09	344.99	6.151	
8,200.00	7,898.63	7,845.63	7,845.63	35.44	313.83	-127.64	-2,384.48	788.88	2,122.08	1,772.82	349.26	6.076	
8,300.00	7,998.63	7,945.63	7,945.63	35.71	317.83	-127.64	-2,384.48	788.88	2,122.08	1,768.55	353.53	6.003	
8,311.85	8,010.48	7,957.48	7,957.48	35.75	318.30	-127.64	-2,384.48	788.88	2,122.08	1,768.04	354.04	5.994	
8,400.00	8,098.63	8,033.00	8,033.00	35.99	321.32	-127.64	-2,384.48	788.88	2,122.12	1,764.83	357.29	5.939 ES, SF	
8,500.00	8,198.63	8,033.00	8,033.00	36.26	321.32	-127.64	-2,384.48	788.88	2,125.07	1,768.00	357.07	5.951	
8,501.37	8,200.00	8,033.00	8,033.00	36.27	321.32	-127.64	-2,384.48	788.88	2,125.14	1,768.08	357.06	5.952	

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-101.27	-633.26	-3,178.78	3,249.25					
100.00	100.00	0.00	0.00	0.36	0.00	-101.27	-633.26	-3,178.78	3,243.77	3,243.40	0.37	8,773.938		
200.00	200.00	0.00	0.00	0.72	0.00	-101.27	-633.26	-3,178.78	3,241.36	3,240.65	0.72	4,518.250		
246.30	246.30	18.30	18.30	0.88	0.73	-101.27	-633.26	-3,178.78	3,241.24	3,239.63	1.61	2,007.057		
300.00	300.00	72.00	72.00	1.08	2.88	-101.27	-633.26	-3,178.78	3,241.24	3,237.29	3.96	819.433		
400.00	400.00	172.00	172.00	1.43	6.88	-101.27	-633.26	-3,178.78	3,241.24	3,232.93	8.31	389.859		
500.00	500.00	272.00	272.00	1.79	10.88	-101.27	-633.26	-3,178.78	3,241.24	3,228.57	12.67	255.773		
600.00	600.00	372.00	372.00	2.15	14.88	-101.27	-633.26	-3,178.78	3,241.24	3,224.21	17.03	190.316		
700.00	700.00	472.00	472.00	2.51	18.88	-101.27	-633.26	-3,178.78	3,241.24	3,219.85	21.39	151.536		
800.00	800.00	572.00	572.00	2.87	22.88	-101.27	-633.26	-3,178.78	3,241.24	3,215.49	25.75	125.884		
900.00	900.00	672.00	672.00	3.23	26.88	-101.27	-633.26	-3,178.78	3,241.24	3,211.14	30.11	107.660		
1,000.00	1,000.00	772.00	772.00	3.58	30.88	-101.27	-633.26	-3,178.78	3,241.24	3,206.78	34.46	94.045		
1,100.00	1,100.00	872.00	872.00	3.94	34.88	-101.27	-633.26	-3,178.78	3,241.24	3,202.42	38.82	83.487		
1,200.00	1,200.00	972.00	972.00	4.30	38.88	-101.27	-633.26	-3,178.78	3,241.24	3,198.06	43.18	75.061		
1,300.00	1,300.00	1,072.00	1,072.00	4.66	42.88	-101.27	-633.26	-3,178.78	3,241.24	3,193.70	47.54	68.179		
1,400.00	1,400.00	1,172.00	1,172.00	5.02	46.88	-101.27	-633.26	-3,178.78	3,241.24	3,189.34	51.90	62.453		
1,500.00	1,500.00	1,272.00	1,272.00	5.38	50.88	-101.27	-633.26	-3,178.78	3,241.24	3,184.98	56.26	57.615		
1,600.00	1,600.00	1,372.00	1,372.00	5.74	54.88	-101.27	-633.26	-3,178.78	3,241.24	3,180.63	60.62	53.472		
1,700.00	1,700.00	1,472.00	1,472.00	6.09	58.88	-101.27	-633.26	-3,178.78	3,241.24	3,176.27	64.97	49.885		
1,800.00	1,800.00	1,572.00	1,572.00	6.45	62.88	-101.27	-633.26	-3,178.78	3,241.24	3,171.91	69.33	46.749		
1,900.00	1,900.00	1,672.00	1,672.00	6.81	66.88	-101.27	-633.26	-3,178.78	3,241.24	3,167.55	73.69	43.984		
2,000.00	2,000.00	1,772.00	1,772.00	7.17	70.88	-101.27	-633.26	-3,178.78	3,241.24	3,163.19	78.05	41.528		
2,100.00	2,100.00	1,872.00	1,872.00	7.53	74.88	-101.27	-633.26	-3,178.78	3,241.24	3,158.83	82.41	39.332		
2,200.00	2,200.00	1,972.00	1,972.00	7.89	78.88	-101.27	-633.26	-3,178.78	3,241.24	3,154.48	86.77	37.356		
2,300.00	2,300.00	2,072.00	2,072.00	8.24	82.88	-101.27	-633.26	-3,178.78	3,241.24	3,150.12	91.12	35.569		
2,400.00	2,400.00	2,172.00	2,172.00	8.60	86.88	-101.27	-633.26	-3,178.78	3,241.24	3,145.76	95.48	33.946		
2,500.00	2,500.00	2,272.00	2,272.00	8.96	90.88	-101.27	-633.26	-3,178.78	3,241.24	3,141.40	99.84	32.464		
2,600.00	2,600.00	2,372.00	2,372.00	9.32	94.88	-101.27	-633.26	-3,178.78	3,241.24	3,137.04	104.20	31.106		
2,700.00	2,700.00	2,472.00	2,472.00	9.68	98.88	-101.27	-633.26	-3,178.78	3,241.24	3,132.68	108.56	29.857		
2,800.00	2,800.00	2,572.00	2,572.00	10.04	102.88	-101.27	-633.26	-3,178.78	3,241.24	3,128.32	112.92	28.705		
2,900.00	2,899.95	2,671.95	2,671.95	10.38	106.88	39.48	-633.26	-3,178.78	3,239.22	3,121.96	117.26	27.625		
3,000.00	2,999.63	2,771.63	2,771.63	10.71	110.87	39.69	-633.26	-3,178.78	3,233.17	3,111.60	121.57	26.595		
3,100.00	3,098.77	2,870.77	2,870.77	11.04	114.83	40.03	-633.26	-3,178.78	3,223.11	3,097.25	125.86	25.608		
3,200.00	3,197.08	2,969.08	2,969.08	11.37	118.76	40.51	-633.26	-3,178.78	3,209.11	3,078.98	130.12	24.662		
3,300.00	3,294.31	3,066.31	3,066.31	11.72	122.65	41.14	-633.26	-3,178.78	3,191.23	3,056.89	134.34	23.754		
3,400.00	3,390.18	3,162.18	3,162.18	12.08	126.49	41.91	-633.26	-3,178.78	3,169.58	3,031.07	138.51	22.883		
3,500.00	3,484.43	3,256.43	3,256.43	12.46	130.26	42.84	-633.26	-3,178.78	3,144.27	3,001.64	142.63	22.045		
3,600.00	3,576.81	3,348.81	3,348.81	12.87	133.95	43.92	-633.26	-3,178.78	3,115.44	2,968.76	146.68	21.240		
3,700.00	3,667.07	3,439.07	3,439.07	13.31	137.56	45.11	-633.26	-3,178.78	3,083.27	2,932.61	150.66	20.465		
3,800.00	3,756.37	3,528.37	3,528.37	13.79	141.13	45.67	-633.26	-3,178.78	3,049.91	2,895.29	154.62	19.725		
3,900.00	3,845.67	3,617.67	3,617.67	14.29	144.71	46.25	-633.26	-3,178.78	3,016.85	2,858.25	158.60	19.022		
4,000.00	3,934.97	3,706.97	3,706.97	14.82	148.28	46.84	-633.26	-3,178.78	2,984.10	2,821.50	162.60	18.352		
4,100.00	4,024.27	3,796.27	3,796.27	15.37	151.85	47.44	-633.26	-3,178.78	2,951.68	2,785.05	166.62	17.715		
4,200.00	4,113.58	3,885.58	3,885.58	15.94	155.42	48.06	-633.26	-3,178.78	2,919.58	2,748.92	170.66	17.107		
4,300.00	4,202.88	3,974.88	3,974.88	16.53	159.00	48.68	-633.26	-3,178.78	2,887.84	2,713.12	174.72	16.528		
4,400.00	4,292.18	4,064.18	4,064.18	17.14	162.57	49.32	-633.26	-3,178.78	2,856.45	2,677.65	178.80	15.976		
4,500.00	4,381.48	4,153.48	4,153.48	17.76	166.14	49.97	-633.26	-3,178.78	2,825.43	2,642.54	182.89	15.449		
4,600.00	4,470.78	4,242.78	4,242.78	18.39	169.71	50.63	-633.26	-3,178.78	2,794.78	2,607.78	187.00	14.945		
4,700.00	4,560.08	4,332.08	4,332.08	19.04	173.28	51.31	-633.26	-3,178.78	2,764.53	2,573.41	191.13	14.464		
4,800.00	4,649.39	4,421.39	4,421.39	19.69	176.86	51.99	-633.26	-3,178.78	2,734.69	2,539.42	195.27	14.005		
4,900.00	4,738.69	4,510.69	4,510.69	20.36	180.43	52.70	-633.26	-3,178.78	2,705.27	2,505.84	199.43	13.565		
5,000.00	4,827.99	4,599.99	4,599.99	21.03	184.00	53.41	-633.26	-3,178.78	2,676.28	2,472.68	203.60	13.145		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.00	4,917.29	4,689.29	4,689.29	21.71	187.57	54.14	-633.26	-3,178.78	2,647.73	2,439.94	207.79	12.742		
5,200.00	5,006.59	4,778.59	4,778.59	22.40	191.14	54.88	-633.26	-3,178.78	2,619.65	2,407.66	211.99	12.357		
5,300.00	5,095.90	4,867.90	4,867.90	23.10	194.72	55.63	-633.26	-3,178.78	2,592.05	2,375.84	216.21	11.989		
5,400.00	5,185.20	4,957.20	4,957.20	23.80	198.29	56.40	-633.26	-3,178.78	2,564.94	2,344.50	220.44	11.635		
5,500.00	5,274.50	5,046.50	5,046.50	24.50	201.86	57.19	-633.26	-3,178.78	2,538.34	2,313.65	224.69	11.297		
5,600.00	5,363.80	5,135.80	5,135.80	25.22	205.43	57.98	-633.26	-3,178.78	2,512.26	2,283.31	228.95	10.973		
5,700.00	5,453.10	5,225.10	5,225.10	25.93	209.00	58.80	-633.26	-3,178.78	2,486.72	2,253.50	233.22	10.663		
5,800.00	5,542.40	5,314.40	5,314.40	26.65	212.58	59.62	-633.26	-3,178.78	2,461.74	2,224.24	237.50	10.365		
5,900.00	5,631.71	5,403.71	5,403.71	27.38	216.15	60.46	-633.26	-3,178.78	2,437.34	2,195.54	241.80	10.080		
6,000.00	5,721.93	5,493.93	5,493.93	28.08	219.76	60.73	-633.26	-3,178.78	2,414.53	2,168.40	246.13	9.810		
6,100.00	5,814.28	5,586.28	5,586.28	28.74	223.45	60.96	-633.26	-3,178.78	2,394.70	2,144.21	250.49	9.560		
6,200.00	5,908.51	5,680.51	5,680.51	29.33	227.22	61.18	-633.26	-3,178.78	2,377.77	2,122.89	254.89	9.329		
6,300.00	6,004.36	5,776.36	5,776.36	29.88	231.05	61.39	-633.26	-3,178.78	2,363.64	2,104.35	259.29	9.116		
6,400.00	6,101.57	5,873.57	5,873.57	30.37	234.94	61.57	-633.26	-3,178.78	2,352.22	2,088.52	263.70	8.920		
6,500.00	6,199.87	5,971.87	5,971.87	30.80	238.87	61.73	-633.26	-3,178.78	2,343.41	2,075.32	268.09	8.741		
6,600.00	6,299.00	6,071.00	6,071.00	31.19	242.84	61.84	-633.26	-3,178.78	2,337.17	2,064.70	272.46	8.578		
6,700.00	6,398.67	6,170.67	6,170.67	31.52	246.83	61.91	-633.26	-3,178.78	2,333.42	2,056.62	276.80	8.430		
6,800.00	6,498.63	6,270.63	6,270.63	31.79	250.83	61.94	-633.26	-3,178.78	2,332.16	2,051.07	281.09	8.297		
6,880.40	6,579.03	6,351.03	6,351.03	31.99	254.04	61.94	-633.26	-3,178.78	2,332.14	2,047.63	284.51	8.197 CC		
6,900.00	6,598.63	6,370.63	6,370.63	32.04	254.83	-78.74	-633.26	-3,178.78	2,332.16	2,046.81	285.35	8.173		
7,000.00	6,698.63	6,470.63	6,470.63	32.29	258.83	-78.74	-633.26	-3,178.78	2,332.16	2,042.55	289.60	8.053		
7,100.00	6,798.63	6,570.63	6,570.63	32.54	262.83	-78.74	-633.26	-3,178.78	2,332.16	2,038.29	293.86	7.936		
7,200.00	6,898.63	6,670.63	6,670.63	32.80	266.83	-78.74	-633.26	-3,178.78	2,332.16	2,034.03	298.13	7.823		
7,300.00	6,998.63	6,770.63	6,770.63	33.05	270.83	-78.74	-633.26	-3,178.78	2,332.16	2,029.77	302.39	7.712		
7,400.00	7,098.63	6,870.63	6,870.63	33.31	274.83	-78.74	-633.26	-3,178.78	2,332.16	2,025.50	306.66	7.605		
7,500.00	7,198.63	6,970.63	6,970.63	33.57	278.83	-78.74	-633.26	-3,178.78	2,332.16	2,021.23	310.92	7.501		
7,600.00	7,298.63	7,070.63	7,070.63	33.83	282.83	-78.74	-633.26	-3,178.78	2,332.16	2,016.96	315.19	7.399		
7,700.00	7,398.63	7,170.63	7,170.63	34.10	286.83	-78.74	-633.26	-3,178.78	2,332.16	2,012.69	319.47	7.300		
7,800.00	7,498.63	7,270.63	7,270.63	34.36	290.83	-78.74	-633.26	-3,178.78	2,332.16	2,008.42	323.74	7.204		
7,900.00	7,598.63	7,370.63	7,370.63	34.63	294.83	-78.74	-633.26	-3,178.78	2,332.16	2,004.14	328.01	7.110		
8,000.00	7,698.63	7,470.63	7,470.63	34.90	298.83	-78.74	-633.26	-3,178.78	2,332.16	1,999.87	332.29	7.018		
8,100.00	7,798.63	7,570.63	7,570.63	35.17	302.83	-78.74	-633.26	-3,178.78	2,332.16	1,995.59	336.57	6.929		
8,200.00	7,898.63	7,670.63	7,670.63	35.44	306.83	-78.74	-633.26	-3,178.78	2,332.16	1,991.31	340.85	6.842		
8,300.00	7,998.63	7,770.63	7,770.63	35.71	310.83	-78.74	-633.26	-3,178.78	2,332.16	1,987.03	345.13	6.757		
8,303.94	8,002.57	7,774.57	7,774.57	35.72	310.98	-78.74	-633.26	-3,178.78	2,332.16	1,986.86	345.30	6.754		
8,400.00	8,098.63	7,843.00	7,843.00	35.99	313.72	-78.74	-633.26	-3,178.78	2,332.32	1,984.02	348.30	6.696 ES, SF		
8,500.00	8,198.63	7,843.00	7,843.00	36.26	313.72	-78.74	-633.26	-3,178.78	2,335.65	1,987.46	348.18	6.708		
8,501.37	8,200.00	7,843.00	7,843.00	36.27	313.72	-78.74	-633.26	-3,178.78	2,335.72	1,987.55	348.18	6.708		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	164.91	-848.22	228.73	878.60					
100.00	100.00	88.00	88.00	0.36	3.52	164.91	-848.22	228.73	878.52	874.64	3.88	226.511		
200.00	200.00	188.00	188.00	0.72	7.52	164.91	-848.22	228.73	878.52	870.28	8.24	106.656		
300.00	300.00	288.00	288.00	1.08	11.52	164.91	-848.22	228.73	878.52	865.93	12.60	69.749		
400.00	400.00	388.00	388.00	1.43	15.52	164.91	-848.22	228.73	878.52	861.57	16.95	51.818		
500.00	500.00	488.00	488.00	1.79	19.52	164.91	-848.22	228.73	878.52	857.21	21.31	41.221		
600.00	600.00	588.00	588.00	2.15	23.52	164.91	-848.22	228.73	878.52	852.85	25.67	34.223		
700.00	700.00	688.00	688.00	2.51	27.52	164.91	-848.22	228.73	878.52	848.49	30.03	29.255		
800.00	800.00	788.00	788.00	2.87	31.52	164.91	-848.22	228.73	878.52	844.13	34.39	25.548		
900.00	900.00	888.00	888.00	3.23	35.52	164.91	-848.22	228.73	878.52	839.78	38.75	22.674		
1,000.00	1,000.00	988.00	988.00	3.58	39.52	164.91	-848.22	228.73	878.52	835.42	43.10	20.381		
1,100.00	1,100.00	1,088.00	1,088.00	3.94	43.52	164.91	-848.22	228.73	878.52	831.06	47.46	18.510		
1,200.00	1,200.00	1,188.00	1,188.00	4.30	47.52	164.91	-848.22	228.73	878.52	826.70	51.82	16.953		
1,300.00	1,300.00	1,288.00	1,288.00	4.66	51.52	164.91	-848.22	228.73	878.52	822.34	56.18	15.638		
1,400.00	1,400.00	1,388.00	1,388.00	5.02	55.52	164.91	-848.22	228.73	878.52	817.98	60.54	14.512		
1,500.00	1,500.00	1,488.00	1,488.00	5.38	59.52	164.91	-848.22	228.73	878.52	813.62	64.90	13.537		
1,600.00	1,600.00	1,588.00	1,588.00	5.74	63.52	164.91	-848.22	228.73	878.52	809.27	69.26	12.685		
1,700.00	1,700.00	1,688.00	1,688.00	6.09	67.52	164.91	-848.22	228.73	878.52	804.91	73.61	11.934		
1,800.00	1,800.00	1,788.00	1,788.00	6.45	71.52	164.91	-848.22	228.73	878.52	800.55	77.97	11.267		
1,900.00	1,900.00	1,888.00	1,888.00	6.81	75.52	164.91	-848.22	228.73	878.52	796.19	82.33	10.671		
2,000.00	2,000.00	1,988.00	1,988.00	7.17	79.52	164.91	-848.22	228.73	878.52	791.83	86.69	10.134		
2,100.00	2,100.00	2,088.00	2,088.00	7.53	83.52	164.91	-848.22	228.73	878.52	787.47	91.05	9.649		
2,200.00	2,200.00	2,188.00	2,188.00	7.89	87.52	164.91	-848.22	228.73	878.52	783.12	95.41	9.208		
2,300.00	2,300.00	2,288.00	2,288.00	8.24	91.52	164.91	-848.22	228.73	878.52	778.76	99.76	8.806		
2,400.00	2,400.00	2,388.00	2,388.00	8.60	95.52	164.91	-848.22	228.73	878.52	774.40	104.12	8.437		
2,500.00	2,500.00	2,488.00	2,488.00	8.96	99.52	164.91	-848.22	228.73	878.52	770.04	108.48	8.098		
2,600.00	2,600.00	2,588.00	2,588.00	9.32	103.52	164.91	-848.22	228.73	878.52	765.68	112.84	7.786		
2,700.00	2,700.00	2,688.00	2,688.00	9.68	107.52	164.91	-848.22	228.73	878.52	761.32	117.20	7.496		
2,800.00	2,800.00	2,788.00	2,788.00	10.04	111.52	164.91	-848.22	228.73	878.52	756.96	121.56	7.227		
2,900.00	2,899.95	2,887.95	2,887.95	10.38	115.52	-54.59	-848.22	228.73	877.00	751.10	125.90	6.966		
3,000.00	2,999.63	2,987.63	2,987.63	10.71	119.51	-55.12	-848.22	228.73	872.47	742.26	130.21	6.700		
3,100.00	3,098.77	3,086.77	3,086.77	11.04	123.47	-56.01	-848.22	228.73	865.05	730.54	134.51	6.431		
3,200.00	3,197.08	3,185.08	3,185.08	11.37	127.40	-57.26	-848.22	228.73	854.91	716.13	138.78	6.160		
3,300.00	3,294.31	3,282.31	3,282.31	11.72	131.29	-58.90	-848.22	228.73	842.31	699.30	143.01	5.890		
3,400.00	3,390.18	3,378.18	3,378.18	12.08	135.13	-60.92	-848.22	228.73	827.62	680.42	147.20	5.622		
3,500.00	3,484.43	3,472.43	3,472.43	12.46	138.90	-63.33	-848.22	228.73	811.28	659.94	151.34	5.361		
3,600.00	3,576.81	3,564.81	3,564.81	12.87	142.59	-66.12	-848.22	228.73	793.86	638.43	155.43	5.107		
3,700.00	3,667.07	3,655.07	3,655.07	13.31	146.20	-69.25	-848.22	228.73	776.07	616.59	159.48	4.866		
3,800.00	3,756.37	3,744.37	3,744.37	13.79	149.77	-72.12	-848.22	228.73	759.62	596.10	163.52	4.645		
3,900.00	3,845.67	3,833.67	3,833.67	14.29	153.35	-75.08	-848.22	228.73	745.53	577.93	167.60	4.448		
4,000.00	3,934.97	3,922.97	3,922.97	14.82	156.92	-78.13	-848.22	228.73	733.93	562.23	171.71	4.274		
4,100.00	4,024.27	4,012.27	4,012.27	15.37	160.49	-81.25	-848.22	228.73	724.95	549.10	175.84	4.123		
4,200.00	4,113.58	4,101.58	4,101.58	15.94	164.06	-84.42	-848.22	228.73	718.67	538.67	180.00	3.993		
4,300.00	4,202.88	4,190.88	4,190.88	16.53	167.64	-87.63	-848.22	228.73	715.18	531.01	184.17	3.883		
4,373.62	4,268.62	4,256.62	4,256.62	16.98	170.26	-90.00	-848.22	228.73	714.41	527.17	187.24	3.815 CC		
4,400.00	4,292.18	4,280.18	4,280.18	17.14	171.21	-90.85	-848.22	228.73	714.51	526.17	188.34	3.794		
4,500.00	4,381.48	4,369.48	4,369.48	17.76	174.78	-94.07	-848.22	228.73	716.67	524.15	192.52	3.723 ES		
4,600.00	4,470.78	4,458.78	4,458.78	18.39	178.35	-97.26	-848.22	228.73	721.64	524.95	196.69	3.669		
4,700.00	4,560.08	4,548.08	4,548.08	19.04	181.92	-100.40	-848.22	228.73	729.35	528.51	200.84	3.631		
4,800.00	4,649.39	4,637.39	4,637.39	19.69	185.50	-103.49	-848.22	228.73	739.73	534.75	204.98	3.609		
4,900.00	4,738.69	4,726.69	4,726.69	20.36	189.07	-106.49	-848.22	228.73	752.66	543.56	209.10	3.600 SF		
5,000.00	4,827.99	4,815.99	4,815.99	21.03	192.64	-109.41	-848.22	228.73	768.01	554.81	213.20	3.602		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,100.00	4,917.29	4,905.29	4,905.29	21.71	196.21	-112.23	-848.22	228.73	785.64	568.37	217.27	3.616	
5,200.00	5,006.59	4,994.59	4,994.59	22.40	199.78	-114.93	-848.22	228.73	805.41	584.08	221.33	3.639	
5,300.00	5,095.90	5,083.90	5,083.90	23.10	203.36	-117.52	-848.22	228.73	827.15	601.79	225.36	3.670	
5,400.00	5,185.20	5,173.20	5,173.20	23.80	206.93	-120.00	-848.22	228.73	850.72	621.35	229.37	3.709	
5,500.00	5,274.50	5,262.50	5,262.50	24.50	210.50	-122.36	-848.22	228.73	875.97	642.60	233.37	3.754	
5,600.00	5,363.80	5,351.80	5,351.80	25.22	214.07	-124.60	-848.22	228.73	902.76	665.41	237.35	3.804	
5,700.00	5,453.10	5,441.10	5,441.10	25.93	217.64	-126.73	-848.22	228.73	930.95	689.63	241.32	3.858	
5,800.00	5,542.40	5,530.40	5,530.40	26.65	221.22	-128.74	-848.22	228.73	960.43	715.15	245.28	3.916	
5,900.00	5,631.71	5,619.71	5,619.71	27.38	224.79	-130.65	-848.22	228.73	991.07	741.84	249.23	3.977	
6,000.00	5,721.93	5,709.93	5,709.93	28.08	228.40	-133.02	-848.22	228.73	1,021.41	768.20	253.20	4.034	
6,100.00	5,814.28	5,802.28	5,802.28	28.74	232.09	-135.11	-848.22	228.73	1,049.14	791.89	257.25	4.078	
6,200.00	5,908.51	5,896.51	5,896.51	29.33	235.86	-136.86	-848.22	228.73	1,073.88	812.51	261.36	4.109	
6,300.00	6,004.36	5,992.36	5,992.36	29.88	239.69	-138.30	-848.22	228.73	1,095.29	829.76	265.53	4.125	
6,400.00	6,101.57	5,993.00	5,993.00	30.37	239.72	-138.75	-848.22	228.73	1,117.33	852.71	264.62	4.222	
6,500.00	6,199.87	5,993.00	5,993.00	30.80	239.72	-139.30	-848.22	228.73	1,143.96	882.16	261.79	4.370	
6,600.00	6,299.00	5,993.00	5,993.00	31.19	239.72	-139.93	-848.22	228.73	1,174.80	917.49	257.31	4.566	
6,700.00	6,398.67	5,993.00	5,993.00	31.52	239.72	-140.64	-848.22	228.73	1,209.45	958.04	251.41	4.811	
6,800.00	6,498.63	5,993.00	5,993.00	31.79	239.72	-141.41	-848.22	228.73	1,247.50	1,003.18	244.33	5.106	
6,900.00	6,598.63	5,993.00	5,993.00	32.04	239.72	77.89	-848.22	228.73	1,290.35	1,053.95	236.39	5.459	
7,000.00	6,698.63	5,993.00	5,993.00	32.29	239.72	77.89	-848.22	228.73	1,339.30	1,111.33	227.97	5.875	
7,100.00	6,798.63	5,993.00	5,993.00	32.54	239.72	77.89	-848.22	228.73	1,393.72	1,174.39	219.32	6.355	
7,200.00	6,898.63	5,993.00	5,993.00	32.80	239.72	77.89	-848.22	228.73	1,452.99	1,242.31	210.67	6.897	
7,300.00	6,998.63	5,993.00	5,993.00	33.05	239.72	77.89	-848.22	228.73	1,516.54	1,314.37	202.17	7.501	
7,400.00	7,098.63	5,993.00	5,993.00	33.31	239.72	77.89	-848.22	228.73	1,583.86	1,389.92	193.94	8.167	
7,500.00	7,198.63	5,993.00	5,993.00	33.57	239.72	77.89	-848.22	228.73	1,654.49	1,468.43	186.06	8.892	
7,600.00	7,298.63	5,993.00	5,993.00	33.83	239.72	77.89	-848.22	228.73	1,728.02	1,549.46	178.57	9.677	
7,700.00	7,398.63	5,993.00	5,993.00	34.10	239.72	77.89	-848.22	228.73	1,804.10	1,632.62	171.49	10.520	
7,800.00	7,498.63	5,993.00	5,993.00	34.36	239.72	77.89	-848.22	228.73	1,882.42	1,717.59	164.83	11.420	
7,900.00	7,598.63	5,993.00	5,993.00	34.63	239.72	77.89	-848.22	228.73	1,962.71	1,804.13	158.59	12.376	
8,000.00	7,698.63	5,993.00	5,993.00	34.90	239.72	77.89	-848.22	228.73	2,044.74	1,892.00	152.75	13.387	
8,100.00	7,798.63	5,993.00	5,993.00	35.17	239.72	77.89	-848.22	228.73	2,128.31	1,981.02	147.29	14.450	
8,200.00	7,898.63	5,993.00	5,993.00	35.44	239.72	77.89	-848.22	228.73	2,213.24	2,071.04	142.20	15.565	
8,300.00	7,998.63	5,993.00	5,993.00	35.71	239.72	77.89	-848.22	228.73	2,299.38	2,161.94	137.44	16.730	
8,400.00	8,098.63	5,993.00	5,993.00	35.99	239.72	77.89	-848.22	228.73	2,386.60	2,253.59	133.01	17.943	
8,500.00	8,198.63	5,993.00	5,993.00	36.26	239.72	77.89	-848.22	228.73	2,474.79	2,345.92	128.87	19.204	
8,501.37	8,200.00	5,993.00	5,993.00	36.27	239.72	77.89	-848.22	228.73	2,476.01	2,347.19	128.82	19.221	



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 390-MWD SDI													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	55.87	1,838.56	2,712.28	3,290.59					
100.00	100.00	0.00	0.00	0.36	0.00	55.87	1,838.56	2,712.28	3,282.92	3,282.54	0.38	8,528.214		
200.00	200.00	0.00	0.00	0.72	0.00	55.87	1,838.56	2,712.28	3,278.29	3,277.57	0.72	4,550.753		
300.00	300.00	0.00	0.00	1.08	0.00	55.87	1,838.56	2,712.28	3,276.70	3,275.63	1.08	3,046.350		
304.45	304.45	0.00	0.00	1.09	0.00	55.87	1,838.56	2,712.28	3,276.70	3,275.61	1.09	3,001.830		
400.00	400.00	87.06	87.06	1.43	0.10	55.87	1,838.65	2,712.40	3,276.86	3,275.33	1.53	2,138.971		
500.00	500.00	175.89	175.88	1.79	0.20	55.87	1,838.93	2,712.75	3,277.37	3,275.38	1.99	1,646.634		
600.00	600.00	264.71	264.71	2.15	0.30	55.87	1,839.40	2,713.33	3,278.21	3,275.76	2.45	1,338.759		
700.00	700.00	1,344.11	1,316.39	2.51	4.24	53.78	1,846.59	2,521.61	3,257.58	3,251.59	6.00	543.330		
800.00	800.00	1,409.14	1,378.32	2.87	4.59	53.62	1,843.17	2,502.06	3,229.95	3,223.36	6.58	490.772		
900.00	900.00	1,526.78	1,490.50	3.23	5.26	53.35	1,835.96	2,467.41	3,202.41	3,195.05	7.36	435.005		
1,000.00	1,000.00	1,611.00	1,570.67	3.58	5.74	53.14	1,830.91	2,442.08	3,174.51	3,166.48	8.03	395.146		
1,100.00	1,100.00	1,675.00	1,631.84	3.94	6.09	52.99	1,827.23	2,423.61	3,147.69	3,139.07	8.63	364.894		
1,200.00	1,200.00	1,764.77	1,717.75	4.30	6.58	52.76	1,822.55	2,398.00	3,121.55	3,112.22	9.32	334.834		
1,300.00	1,300.00	1,912.77	1,858.52	4.66	7.46	52.33	1,816.58	2,352.72	3,094.47	3,084.20	10.27	301.230		
1,400.00	1,400.00	1,999.10	1,940.25	5.02	8.00	52.04	1,814.07	2,325.06	3,066.94	3,055.92	11.02	278.287		
1,500.00	1,500.00	2,129.11	2,062.55	5.38	8.86	51.53	1,812.52	2,281.00	3,039.02	3,027.01	12.01	253.009		
1,600.00	1,600.00	2,265.32	2,189.20	5.74	9.82	50.89	1,813.45	2,230.91	3,009.95	2,996.84	13.12	229.501		
1,700.00	1,700.00	2,404.69	2,317.26	6.09	10.90	50.16	1,815.74	2,175.95	2,979.38	2,965.06	14.33	207.958		
1,800.00	1,800.00	2,502.64	2,407.00	6.45	11.65	49.62	1,817.14	2,136.73	2,948.54	2,933.23	15.31	192.547		
1,900.00	1,900.00	2,666.83	2,557.58	6.81	12.91	48.75	1,816.42	2,071.29	2,917.26	2,900.63	16.63	175.410		
2,000.00	2,000.00	2,762.51	2,645.09	7.17	13.65	48.26	1,813.71	2,032.72	2,884.17	2,866.59	17.58	164.048		
2,100.00	2,100.00	2,847.01	2,723.09	7.53	14.27	47.86	1,810.01	2,000.43	2,851.95	2,833.51	18.44	154.662		
2,200.00	2,200.00	2,935.00	2,804.10	7.89	14.93	47.43	1,806.19	1,966.31	2,819.53	2,800.20	19.33	145.828		
2,300.00	2,300.00	3,015.64	2,878.36	8.24	15.54	47.02	1,803.47	1,935.00	2,787.79	2,767.58	20.21	137.911		
2,400.00	2,400.00	3,084.66	2,942.15	8.60	16.04	46.67	1,800.76	1,908.77	2,756.58	2,735.55	21.03	131.065		
2,500.00	2,500.00	3,143.10	2,996.46	8.96	16.45	46.38	1,798.70	1,887.29	2,726.67	2,704.88	21.79	125.113		
2,600.00	2,600.00	3,248.99	3,095.37	9.32	17.17	45.87	1,794.49	1,849.72	2,697.68	2,674.93	22.75	118.591		
2,700.00	2,700.00	3,303.24	3,146.07	9.68	17.54	45.61	1,792.23	1,830.55	2,668.82	2,645.33	23.49	113.605		
2,800.00	2,800.00	3,370.34	3,209.26	10.04	17.97	45.30	1,789.55	1,808.16	2,641.56	2,617.28	24.27	108.822		
2,900.00	2,899.95	3,441.00	3,275.77	10.38	18.44	-174.44	1,787.37	1,784.41	2,617.52	2,592.45	25.08	104.387		
3,000.00	2,999.63	3,489.91	3,322.10	10.71	18.74	-174.73	1,786.39	1,768.75	2,600.41	2,574.64	25.77	100.926		
3,100.00	3,098.77	3,662.00	3,484.09	11.04	19.87	-175.67	1,782.51	1,710.89	2,587.14	2,560.10	27.03	95.699		
3,200.00	3,197.08	3,757.00	3,573.20	11.37	20.50	-176.20	1,779.67	1,678.10	2,578.47	2,550.49	27.98	92.164		
3,300.00	3,294.31	3,841.14	3,652.64	11.72	21.03	-176.63	1,776.09	1,650.61	2,575.70	2,546.86	28.84	89.308 CC		
3,304.45	3,298.61	3,843.49	3,654.87	11.73	21.05	-176.64	1,775.96	1,649.88	2,575.72	2,546.84	28.87	89.208 ES		
3,400.00	3,390.18	3,902.53	3,711.12	12.08	21.39	-176.89	1,772.68	1,632.26	2,579.38	2,549.80	29.58	87.201		
3,500.00	3,484.43	3,947.00	3,753.66	12.46	21.63	-177.07	1,770.35	1,619.50	2,589.81	2,559.56	30.25	85.615		
3,600.00	3,576.81	3,979.00	3,784.46	12.87	21.80	-177.17	1,768.99	1,610.95	2,607.78	2,576.92	30.85	84.520		
3,700.00	3,667.07	4,010.00	3,814.56	13.31	21.94	-177.26	1,767.90	1,603.59	2,633.38	2,601.96	31.42	83.807		
3,800.00	3,756.37	4,074.00	3,877.08	13.79	22.21	-177.49	1,765.93	1,590.09	2,662.98	2,630.92	32.05	83.076		
3,900.00	3,845.67	4,135.00	3,936.73	14.29	22.47	-177.71	1,764.57	1,577.38	2,693.56	2,660.87	32.68	82.413		
4,000.00	3,934.97	4,207.72	4,007.88	14.82	22.77	-177.98	1,764.36	1,562.36	2,725.52	2,692.15	33.37	81.686		
4,100.00	4,024.27	4,344.95	4,142.00	15.37	23.35	-178.50	1,763.94	1,533.29	2,757.34	2,723.03	34.30	80.381		
4,200.00	4,113.58	4,389.00	4,185.08	15.94	23.53	-178.66	1,763.50	1,524.17	2,789.04	2,754.15	34.89	79.945		
4,300.00	4,202.88	4,449.94	4,245.11	16.53	23.74	-178.83	1,762.45	1,513.78	2,822.43	2,786.95	35.48	79.549		
4,400.00	4,292.18	4,546.00	4,339.97	17.14	24.05	-179.03	1,758.71	1,499.06	2,855.47	2,819.34	36.14	79.020		
4,500.00	4,381.48	4,594.46	4,387.90	17.76	24.20	-179.13	1,757.06	1,492.17	2,889.77	2,853.12	36.66	78.837 SF		
4,600.00	4,470.78	4,624.63	4,417.84	18.39	24.28	-179.18	1,756.34	1,488.50	2,925.96	2,888.86	37.10	78.859		
4,700.00	4,560.08	4,652.14	4,445.20	19.04	24.35	-179.23	1,756.09	1,485.65	2,964.23	2,926.71	37.52	79.000		
4,800.00	4,649.39	4,685.00	4,477.95	19.69	24.42	-179.28	1,756.11	1,482.95	3,004.43	2,966.50	37.93	79.205		
4,900.00	4,738.69	4,685.00	4,477.95	20.36	24.42	-179.28	1,756.11	1,482.95	3,046.87	3,008.66	38.22	79.723		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 390-MWD SDI													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,000.00	4,827.99	4,685.00	4,477.95	21.03	24.42	-179.28	1,756.11	1,482.95	3,091.97	3,053.50	38.47	80.372		
5,100.00	4,917.29	4,685.00	4,477.95	21.71	24.42	-179.28	1,756.11	1,482.95	3,139.60	3,100.91	38.69	81.144		
5,200.00	5,006.59	4,685.00	4,477.95	22.40	24.42	-179.28	1,756.11	1,482.95	3,189.66	3,150.77	38.88	82.032		
5,300.00	5,095.90	4,685.00	4,477.95	23.10	24.42	-179.28	1,756.11	1,482.95	3,242.02	3,202.98	39.05	83.026		
5,400.00	5,185.20	4,685.00	4,477.95	23.80	24.42	-179.28	1,756.11	1,482.95	3,296.60	3,257.41	39.19	84.122		
5,500.00	5,274.50	4,685.00	4,477.95	24.50	24.42	-179.28	1,756.11	1,482.95	3,353.26	3,313.95	39.31	85.310		
5,600.00	5,363.80	4,685.00	4,477.95	25.22	24.42	-179.28	1,756.11	1,482.95	3,411.92	3,372.51	39.40	86.587		
5,700.00	5,453.10	4,685.00	4,477.95	25.93	24.42	-179.28	1,756.11	1,482.95	3,472.46	3,432.98	39.48	87.945		
5,800.00	5,542.40	4,685.00	4,477.95	26.65	24.42	-179.28	1,756.11	1,482.95	3,534.80	3,495.25	39.55	89.379		
5,900.00	5,631.71	4,685.00	4,477.95	27.38	24.42	-179.28	1,756.11	1,482.95	3,598.84	3,559.24	39.60	90.882		
6,000.00	5,721.93	4,685.00	4,477.95	28.08	24.42	-179.30	1,756.11	1,482.95	3,662.88	3,623.24	39.63	92.427		
6,100.00	5,814.28	4,685.00	4,477.95	28.74	24.42	-179.33	1,756.11	1,482.95	3,724.51	3,684.87	39.64	93.962		
6,200.00	5,908.51	4,685.00	4,477.95	29.33	24.42	-179.36	1,756.11	1,482.95	3,783.68	3,744.05	39.63	95.486		
6,300.00	6,004.36	4,685.00	4,477.95	29.88	24.42	-179.38	1,756.11	1,482.95	3,840.34	3,800.75	39.59	97.005		
6,400.00	6,101.57	4,685.00	4,477.95	30.37	24.42	-179.40	1,756.11	1,482.95	3,894.44	3,854.91	39.53	98.522		
6,500.00	6,199.87	4,685.00	4,477.95	30.80	24.42	-179.42	1,756.11	1,482.95	3,945.95	3,906.50	39.44	100.043		
6,600.00	6,299.00	4,685.00	4,477.95	31.19	24.42	-179.44	1,756.11	1,482.95	3,994.82	3,955.49	39.33	101.572		
6,700.00	6,398.67	4,685.00	4,477.95	31.52	24.42	-179.45	1,756.11	1,482.95	4,041.03	4,001.84	39.19	103.112		
6,800.00	6,498.63	4,685.00	4,477.95	31.79	24.42	-179.47	1,756.11	1,482.95	4,084.54	4,045.51	39.02	104.668		
6,900.00	6,598.63	4,685.00	4,477.95	32.04	24.42	39.85	1,756.11	1,482.95	4,127.61	4,088.77	38.84	106.263		
7,000.00	6,698.63	4,685.00	4,477.95	32.29	24.42	39.85	1,756.11	1,482.95	4,172.64	4,133.98	38.66	107.928		
7,100.00	6,798.63	4,685.00	4,477.95	32.54	24.42	39.85	1,756.11	1,482.95	4,219.55	4,181.08	38.48	109.665		
7,200.00	6,898.63	4,685.00	4,477.95	32.80	24.42	39.85	1,756.11	1,482.95	4,268.30	4,230.01	38.29	111.473		
7,300.00	6,998.63	4,685.00	4,477.95	33.05	24.42	39.85	1,756.11	1,482.95	4,318.81	4,280.71	38.10	113.346		
7,400.00	7,098.63	4,685.00	4,477.95	33.31	24.42	39.85	1,756.11	1,482.95	4,371.02	4,333.11	37.92	115.281		
7,500.00	7,198.63	4,685.00	4,477.95	33.57	24.42	39.85	1,756.11	1,482.95	4,424.88	4,387.15	37.73	117.273		
7,600.00	7,298.63	4,685.00	4,477.95	33.83	24.42	39.85	1,756.11	1,482.95	4,480.32	4,442.78	37.55	119.320		
7,700.00	7,398.63	4,685.00	4,477.95	34.10	24.42	39.85	1,756.11	1,482.95	4,537.30	4,499.93	37.37	121.417		
7,800.00	7,498.63	4,685.00	4,477.95	34.36	24.42	39.85	1,756.11	1,482.95	4,595.74	4,558.54	37.19	123.560		
7,900.00	7,598.63	4,685.00	4,477.95	34.63	24.42	39.85	1,756.11	1,482.95	4,655.59	4,618.57	37.02	125.745		
8,000.00	7,698.63	4,685.00	4,477.95	34.90	24.42	39.85	1,756.11	1,482.95	4,716.81	4,679.95	36.86	127.968		
8,100.00	7,798.63	4,685.00	4,477.95	35.17	24.42	39.85	1,756.11	1,482.95	4,779.33	4,742.63	36.70	130.224		
8,200.00	7,898.63	4,685.00	4,477.95	35.44	24.42	39.85	1,756.11	1,482.95	4,843.11	4,806.56	36.55	132.510		
8,300.00	7,998.63	4,685.00	4,477.95	35.71	24.42	39.85	1,756.11	1,482.95	4,908.10	4,871.70	36.40	134.822		
8,400.00	8,098.63	4,685.00	4,477.95	35.99	24.42	39.85	1,756.11	1,482.95	4,974.25	4,937.99	36.27	137.155		
8,500.00	8,198.63	4,685.00	4,477.95	36.26	24.42	39.85	1,756.11	1,482.95	5,041.52	5,005.38	36.14	139.506		
8,501.37	8,200.00	4,685.00	4,477.95	36.27	24.42	39.85	1,756.11	1,482.95	5,042.45	5,006.32	36.14	139.538		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	120.64	-913.71	1,542.49	1,792.97					
100.00	100.00	75.00	75.00	0.36	3.00	120.64	-913.71	1,542.49	1,792.80	1,789.44	3.36	533.806		
200.00	200.00	175.00	175.00	0.72	7.00	120.64	-913.71	1,542.49	1,792.80	1,785.08	7.72	232.320		
300.00	300.00	275.00	275.00	1.08	11.00	120.64	-913.71	1,542.49	1,792.80	1,780.72	12.08	148.467		
400.00	400.00	375.00	375.00	1.43	15.00	120.64	-913.71	1,542.49	1,792.80	1,776.37	16.43	109.092		
500.00	500.00	475.00	475.00	1.79	19.00	120.64	-913.71	1,542.49	1,792.80	1,772.01	20.79	86.224		
600.00	600.00	575.00	575.00	2.15	23.00	120.64	-913.71	1,542.49	1,792.80	1,767.65	25.15	71.282		
700.00	700.00	675.00	675.00	2.51	27.00	120.64	-913.71	1,542.49	1,792.80	1,763.29	29.51	60.754		
800.00	800.00	775.00	775.00	2.87	31.00	120.64	-913.71	1,542.49	1,792.80	1,758.93	33.87	52.935		
900.00	900.00	875.00	875.00	3.23	35.00	120.64	-913.71	1,542.49	1,792.80	1,754.57	38.23	46.900		
1,000.00	1,000.00	975.00	975.00	3.58	39.00	120.64	-913.71	1,542.49	1,792.80	1,750.21	42.58	42.100		
1,100.00	1,100.00	1,075.00	1,075.00	3.94	43.00	120.64	-913.71	1,542.49	1,792.80	1,745.86	46.94	38.191		
1,200.00	1,200.00	1,175.00	1,175.00	4.30	47.00	120.64	-913.71	1,542.49	1,792.80	1,741.50	51.30	34.946		
1,300.00	1,300.00	1,275.00	1,275.00	4.66	51.00	120.64	-913.71	1,542.49	1,792.80	1,737.14	55.66	32.210		
1,400.00	1,400.00	1,375.00	1,375.00	5.02	55.00	120.64	-913.71	1,542.49	1,792.80	1,732.78	60.02	29.871		
1,500.00	1,500.00	1,475.00	1,475.00	5.38	59.00	120.64	-913.71	1,542.49	1,792.80	1,728.42	64.38	27.848		
1,600.00	1,600.00	1,575.00	1,575.00	5.74	63.00	120.64	-913.71	1,542.49	1,792.80	1,724.06	68.74	26.083		
1,700.00	1,700.00	1,675.00	1,675.00	6.09	67.00	120.64	-913.71	1,542.49	1,792.80	1,719.70	73.09	24.527		
1,800.00	1,800.00	1,775.00	1,775.00	6.45	71.00	120.64	-913.71	1,542.49	1,792.80	1,715.35	77.45	23.147		
1,900.00	1,900.00	1,875.00	1,875.00	6.81	75.00	120.64	-913.71	1,542.49	1,792.80	1,710.99	81.81	21.914		
2,000.00	2,000.00	1,975.00	1,975.00	7.17	79.00	120.64	-913.71	1,542.49	1,792.80	1,706.63	86.17	20.806		
2,100.00	2,100.00	2,075.00	2,075.00	7.53	83.00	120.64	-913.71	1,542.49	1,792.80	1,702.27	90.53	19.804		
2,200.00	2,200.00	2,175.00	2,175.00	7.89	87.00	120.64	-913.71	1,542.49	1,792.80	1,697.91	94.89	18.894		
2,300.00	2,300.00	2,275.00	2,275.00	8.24	91.00	120.64	-913.71	1,542.49	1,792.80	1,693.55	99.24	18.064		
2,400.00	2,400.00	2,375.00	2,375.00	8.60	95.00	120.64	-913.71	1,542.49	1,792.80	1,689.20	103.60	17.304		
2,500.00	2,500.00	2,475.00	2,475.00	8.96	99.00	120.64	-913.71	1,542.49	1,792.80	1,684.84	107.96	16.606		
2,600.00	2,600.00	2,575.00	2,575.00	9.32	103.00	120.64	-913.71	1,542.49	1,792.80	1,680.48	112.32	15.961		
2,700.00	2,700.00	2,675.00	2,675.00	9.68	107.00	120.64	-913.71	1,542.49	1,792.80	1,676.12	116.68	15.365		
2,800.00	2,800.00	2,775.00	2,775.00	10.04	111.00	120.64	-913.71	1,542.49	1,792.80	1,671.76	121.04	14.812 CC		
2,900.00	2,899.95	2,874.95	2,874.95	10.38	115.00	-98.75	-913.71	1,542.49	1,793.20	1,667.82	125.38	14.302		
3,000.00	2,999.63	2,974.63	2,974.63	10.71	118.99	-98.96	-913.71	1,542.49	1,794.41	1,664.72	129.69	13.836		
3,100.00	3,098.77	3,073.77	3,073.77	11.04	122.95	-99.30	-913.71	1,542.49	1,796.50	1,662.51	133.99	13.408		
3,200.00	3,197.08	3,172.08	3,172.08	11.37	126.88	-99.78	-913.71	1,542.49	1,799.57	1,661.32	138.25	13.017		
3,300.00	3,294.31	3,269.31	3,269.31	11.72	130.77	-100.36	-913.71	1,542.49	1,803.76	1,661.28	142.48	12.659 ES		
3,400.00	3,390.18	3,365.18	3,365.18	12.08	134.61	-101.05	-913.71	1,542.49	1,809.26	1,662.59	146.68	12.335		
3,500.00	3,484.43	3,459.43	3,459.43	12.46	138.38	-101.82	-913.71	1,542.49	1,816.27	1,665.45	150.82	12.043		
3,600.00	3,576.81	3,551.81	3,551.81	12.87	142.07	-102.65	-913.71	1,542.49	1,825.02	1,670.11	154.92	11.781		
3,700.00	3,667.07	3,642.07	3,642.07	13.31	145.68	-103.56	-913.71	1,542.49	1,835.77	1,676.81	158.96	11.549		
3,800.00	3,756.37	3,731.37	3,731.37	13.79	149.25	-104.78	-913.71	1,542.49	1,848.01	1,685.03	162.98	11.339		
3,900.00	3,845.67	3,820.67	3,820.67	14.29	152.83	-105.99	-913.71	1,542.49	1,861.26	1,694.23	167.04	11.143		
4,000.00	3,934.97	3,909.97	3,909.97	14.82	156.40	-107.18	-913.71	1,542.49	1,875.50	1,704.40	171.10	10.961		
4,100.00	4,024.27	3,999.27	3,999.27	15.37	159.97	-108.36	-913.71	1,542.49	1,890.70	1,715.52	175.19	10.792		
4,200.00	4,113.58	4,088.58	4,088.58	15.94	163.54	-109.52	-913.71	1,542.49	1,906.85	1,727.56	179.28	10.636		
4,300.00	4,202.88	4,177.88	4,177.88	16.53	167.12	-110.67	-913.71	1,542.49	1,923.91	1,740.52	183.39	10.491		
4,400.00	4,292.18	4,267.18	4,267.18	17.14	170.69	-111.80	-913.71	1,542.49	1,941.86	1,754.36	187.50	10.357		
4,500.00	4,381.48	4,356.48	4,356.48	17.76	174.26	-112.91	-913.71	1,542.49	1,960.68	1,769.07	191.62	10.232		
4,600.00	4,470.78	4,445.78	4,445.78	18.39	177.83	-114.00	-913.71	1,542.49	1,980.35	1,784.61	195.74	10.117		
4,700.00	4,560.08	4,535.08	4,535.08	19.04	181.40	-115.08	-913.71	1,542.49	2,000.84	1,800.98	199.86	10.011		
4,800.00	4,649.39	4,624.39	4,624.39	19.69	184.98	-116.13	-913.71	1,542.49	2,022.11	1,818.13	203.98	9.913		
4,900.00	4,738.69	4,713.69	4,713.69	20.36	188.55	-117.17	-913.71	1,542.49	2,044.16	1,836.06	208.11	9.823		
5,000.00	4,827.99	4,802.99	4,802.99	21.03	192.12	-118.19	-913.71	1,542.49	2,066.96	1,854.73	212.23	9.739		
5,100.00	4,917.29	4,892.29	4,892.29	21.71	195.69	-119.19	-913.71	1,542.49	2,090.47	1,874.13	216.35	9.663		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,200.00	5,006.59	4,981.59	4,981.59	22.40	199.26	-120.17	-913.71	1,542.49	2,114.68	1,894.22	220.46	9.592	
5,300.00	5,095.90	5,070.90	5,070.90	23.10	202.84	-121.13	-913.71	1,542.49	2,139.56	1,914.99	224.58	9.527	
5,400.00	5,185.20	5,160.20	5,160.20	23.80	206.41	-122.07	-913.71	1,542.49	2,165.10	1,936.41	228.69	9.468	
5,500.00	5,274.50	5,249.50	5,249.50	24.50	209.98	-123.00	-913.71	1,542.49	2,191.26	1,958.46	232.79	9.413	
5,600.00	5,363.80	5,338.80	5,338.80	25.22	213.55	-123.90	-913.71	1,542.49	2,218.02	1,981.13	236.89	9.363	
5,700.00	5,453.10	5,428.10	5,428.10	25.93	217.12	-124.79	-913.71	1,542.49	2,245.37	2,004.38	240.99	9.317	
5,800.00	5,542.40	5,517.40	5,517.40	26.65	220.70	-125.65	-913.71	1,542.49	2,273.28	2,028.19	245.08	9.275	
5,900.00	5,631.71	5,606.71	5,606.71	27.38	224.27	-126.50	-913.71	1,542.49	2,301.73	2,052.55	249.17	9.237	
6,000.00	5,721.93	5,696.93	5,696.93	28.08	227.88	-127.92	-913.71	1,542.49	2,329.46	2,076.17	253.28	9.197	
6,100.00	5,814.28	5,789.28	5,789.28	28.74	231.57	-129.23	-913.71	1,542.49	2,354.51	2,097.06	257.45	9.146	
6,200.00	5,908.51	5,883.51	5,883.51	29.33	235.34	-130.35	-913.71	1,542.49	2,376.66	2,115.00	261.66	9.083	
6,300.00	6,004.36	5,979.36	5,979.36	29.88	239.17	-131.30	-913.71	1,542.49	2,395.73	2,129.81	265.91	9.009	
6,400.00	6,101.57	6,076.57	6,076.57	30.37	243.06	-132.07	-913.71	1,542.49	2,411.54	2,141.35	270.19	8.925	
6,500.00	6,199.87	6,174.87	6,174.87	30.80	246.99	-132.66	-913.71	1,542.49	2,423.98	2,149.49	274.49	8.831	
6,600.00	6,299.00	6,274.00	6,274.00	31.19	250.96	-133.08	-913.71	1,542.49	2,432.95	2,154.16	278.80	8.727	
6,700.00	6,398.67	6,373.67	6,373.67	31.52	254.95	-133.34	-913.71	1,542.49	2,438.38	2,155.29	283.10	8.613	
6,800.00	6,498.63	6,473.63	6,473.63	31.79	258.95	-133.43	-913.71	1,542.49	2,440.23	2,152.85	287.38	8.491	
6,900.00	6,598.63	6,573.63	6,573.63	32.04	262.95	85.89	-913.71	1,542.49	2,440.23	2,148.58	291.65	8.367	
7,000.00	6,698.63	6,673.63	6,673.63	32.29	266.95	85.89	-913.71	1,542.49	2,440.23	2,144.31	295.93	8.246	
7,100.00	6,798.63	6,773.63	6,773.63	32.54	270.95	85.89	-913.71	1,542.49	2,440.23	2,140.03	300.20	8.129	
7,200.00	6,898.63	6,873.63	6,873.63	32.80	274.95	85.89	-913.71	1,542.49	2,440.23	2,135.76	304.47	8.015	
7,300.00	6,998.63	6,973.63	6,973.63	33.05	278.95	85.89	-913.71	1,542.49	2,440.23	2,131.48	308.75	7.904	
7,400.00	7,098.63	7,073.63	7,073.63	33.31	282.95	85.89	-913.71	1,542.49	2,440.23	2,127.20	313.03	7.796	
7,500.00	7,198.63	7,173.63	7,173.63	33.57	286.95	85.89	-913.71	1,542.49	2,440.23	2,122.92	317.31	7.690	
7,600.00	7,298.63	7,273.63	7,273.63	33.83	290.95	85.89	-913.71	1,542.49	2,440.23	2,118.64	321.59	7.588	
7,700.00	7,398.63	7,373.63	7,373.63	34.10	294.95	85.89	-913.71	1,542.49	2,440.23	2,114.35	325.88	7.488	
7,800.00	7,498.63	7,473.63	7,473.63	34.36	298.95	85.89	-913.71	1,542.49	2,440.23	2,110.07	330.16	7.391	
7,900.00	7,598.63	7,573.63	7,573.63	34.63	302.95	85.89	-913.71	1,542.49	2,440.23	2,105.78	334.45	7.296	
8,000.00	7,698.63	7,673.63	7,673.63	34.90	306.95	85.89	-913.71	1,542.49	2,440.23	2,101.49	338.74	7.204	
8,100.00	7,798.63	7,773.63	7,773.63	35.17	310.95	85.89	-913.71	1,542.49	2,440.23	2,097.20	343.03	7.114	
8,200.00	7,898.63	7,873.63	7,873.63	35.44	314.95	85.89	-913.71	1,542.49	2,440.23	2,092.91	347.32	7.026	
8,300.00	7,998.63	7,973.63	7,973.63	35.71	318.95	85.89	-913.71	1,542.49	2,440.23	2,088.62	351.61	6.940	
8,400.00	8,098.63	8,073.63	8,073.63	35.99	322.95	85.89	-913.71	1,542.49	2,440.23	2,084.33	355.91	6.856 SF	
8,500.00	8,198.63	8,077.00	8,077.00	36.26	323.08	85.89	-913.71	1,542.49	2,442.14	2,086.20	355.95	6.861	
8,501.37	8,200.00	8,077.00	8,077.00	36.27	323.08	85.89	-913.71	1,542.49	2,442.20	2,086.26	355.94	6.861	

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	103.68	-72.81	299.10	308.36					
100.00	100.00	82.00	82.00	0.36	3.28	103.68	-72.81	299.10	307.84	304.20	3.64	84.606		
200.00	200.00	182.00	182.00	0.72	7.28	103.68	-72.81	299.10	307.84	299.84	8.00	38.494		
300.00	300.00	282.00	282.00	1.08	11.28	103.68	-72.81	299.10	307.84	295.48	12.36	24.915		
400.00	400.00	382.00	382.00	1.43	15.28	103.68	-72.81	299.10	307.84	291.12	16.71	18.418		
500.00	500.00	482.00	482.00	1.79	19.28	103.68	-72.81	299.10	307.84	286.77	21.07	14.609		
600.00	600.00	582.00	582.00	2.15	23.28	103.68	-72.81	299.10	307.84	282.41	25.43	12.105		
700.00	700.00	682.00	682.00	2.51	27.28	103.68	-72.81	299.10	307.84	278.05	29.79	10.334		
800.00	800.00	782.00	782.00	2.87	31.28	103.68	-72.81	299.10	307.84	273.69	34.15	9.015		
900.00	900.00	882.00	882.00	3.23	35.28	103.68	-72.81	299.10	307.84	269.33	38.51	7.994		
1,000.00	1,000.00	982.00	982.00	3.58	39.28	103.68	-72.81	299.10	307.84	264.97	42.86	7.182		
1,100.00	1,100.00	1,082.00	1,082.00	3.94	43.28	103.68	-72.81	299.10	307.84	260.61	47.22	6.519		
1,200.00	1,200.00	1,182.00	1,182.00	4.30	47.28	103.68	-72.81	299.10	307.84	256.26	51.58	5.968		
1,300.00	1,300.00	1,282.00	1,282.00	4.66	51.28	103.68	-72.81	299.10	307.84	251.90	55.94	5.503		
1,400.00	1,400.00	1,382.00	1,382.00	5.02	55.28	103.68	-72.81	299.10	307.84	247.54	60.30	5.105		
1,500.00	1,500.00	1,482.00	1,482.00	5.38	59.28	103.68	-72.81	299.10	307.84	243.18	64.66	4.761		
1,600.00	1,600.00	1,582.00	1,582.00	5.74	63.28	103.68	-72.81	299.10	307.84	238.82	69.02	4.460		
1,700.00	1,700.00	1,682.00	1,682.00	6.09	67.28	103.68	-72.81	299.10	307.84	234.46	73.37	4.195		
1,800.00	1,800.00	1,782.00	1,782.00	6.45	71.28	103.68	-72.81	299.10	307.84	230.11	77.73	3.960		
1,900.00	1,900.00	1,882.00	1,882.00	6.81	75.28	103.68	-72.81	299.10	307.84	225.75	82.09	3.750		
2,000.00	2,000.00	1,982.00	1,982.00	7.17	79.28	103.68	-72.81	299.10	307.84	221.39	86.45	3.561		
2,100.00	2,100.00	2,082.00	2,082.00	7.53	83.28	103.68	-72.81	299.10	307.84	217.03	90.81	3.390		
2,200.00	2,200.00	2,182.00	2,182.00	7.89	87.28	103.68	-72.81	299.10	307.84	212.67	95.17	3.235		
2,300.00	2,300.00	2,282.00	2,282.00	8.24	91.28	103.68	-72.81	299.10	307.84	208.31	99.52	3.093		
2,400.00	2,400.00	2,382.00	2,382.00	8.60	95.28	103.68	-72.81	299.10	307.84	203.95	103.88	2.963		
2,500.00	2,500.00	2,482.00	2,482.00	8.96	99.28	103.68	-72.81	299.10	307.84	199.60	108.24	2.844		
2,600.00	2,600.00	2,582.00	2,582.00	9.32	103.28	103.68	-72.81	299.10	307.84	195.24	112.60	2.734		
2,700.00	2,700.00	2,682.00	2,682.00	9.68	107.28	103.68	-72.81	299.10	307.84	190.88	116.96	2.632		
2,800.00	2,800.00	2,782.00	2,782.00	10.04	111.28	103.68	-72.81	299.10	307.84	186.52	121.32	2.537 CC		
2,900.00	2,899.95	2,881.95	2,881.95	10.38	115.28	-116.04	-72.81	299.10	308.98	183.32	125.66	2.459		
3,000.00	2,999.63	2,981.63	2,981.63	10.71	119.27	-117.24	-72.81	299.10	312.51	182.54	129.97	2.404 ES		
3,100.00	3,098.77	3,080.77	3,080.77	11.04	123.23	-119.15	-72.81	299.10	318.72	184.45	134.26	2.374		
3,200.00	3,197.08	3,179.08	3,179.08	11.37	127.16	-121.65	-72.81	299.10	328.06	189.53	138.53	2.368 SF		
3,300.00	3,294.31	3,276.31	3,276.31	11.72	131.05	-124.61	-72.81	299.10	341.08	198.33	142.75	2.389		
3,400.00	3,390.18	3,372.18	3,372.18	12.08	134.89	-127.84	-72.81	299.10	358.33	211.41	146.93	2.439		
3,500.00	3,484.43	3,466.43	3,466.43	12.46	138.66	-131.18	-72.81	299.10	380.33	229.28	151.04	2.518		
3,600.00	3,576.81	3,558.81	3,558.81	12.87	142.35	-134.48	-72.81	299.10	407.45	252.36	155.08	2.627		
3,700.00	3,667.07	3,649.07	3,649.07	13.31	145.96	-137.68	-72.81	299.10	439.93	280.88	159.05	2.766		
3,800.00	3,756.37	3,738.37	3,738.37	13.79	149.53	-141.19	-72.81	299.10	475.69	312.73	162.96	2.919		
3,900.00	3,845.67	3,827.67	3,827.67	14.29	153.11	-144.23	-72.81	299.10	512.91	346.03	166.88	3.073		
4,000.00	3,934.97	3,916.97	3,916.97	14.82	156.68	-146.88	-72.81	299.10	551.30	380.49	170.81	3.228		
4,100.00	4,024.27	4,006.27	4,006.27	15.37	160.25	-149.20	-72.81	299.10	590.61	415.89	174.73	3.380		
4,200.00	4,113.58	4,095.58	4,095.58	15.94	163.82	-151.24	-72.81	299.10	630.69	452.04	178.65	3.530		
4,300.00	4,202.88	4,184.88	4,184.88	16.53	167.40	-153.05	-72.81	299.10	671.40	488.82	182.58	3.677		
4,400.00	4,292.18	4,274.18	4,274.18	17.14	170.97	-154.66	-72.81	299.10	712.62	526.11	186.51	3.821		
4,500.00	4,381.48	4,363.48	4,363.48	17.76	174.54	-156.10	-72.81	299.10	754.27	563.83	190.44	3.961		
4,600.00	4,470.78	4,452.78	4,452.78	18.39	178.11	-157.39	-72.81	299.10	796.29	601.91	194.37	4.097		
4,700.00	4,560.08	4,542.08	4,542.08	19.04	181.68	-158.56	-72.81	299.10	838.61	640.31	198.31	4.229		
4,800.00	4,649.39	4,631.39	4,631.39	19.69	185.26	-159.62	-72.81	299.10	881.21	678.96	202.25	4.357		
4,900.00	4,738.69	4,720.69	4,720.69	20.36	188.83	-160.58	-72.81	299.10	924.03	717.84	206.19	4.482		
5,000.00	4,827.99	4,809.99	4,809.99	21.03	192.40	-161.45	-72.81	299.10	967.05	756.92	210.13	4.602		
5,100.00	4,917.29	4,899.29	4,899.29	21.71	195.97	-162.26	-72.81	299.10	1,010.24	796.16	214.07	4.719		

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



Scientific Drilling

Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,006.59	4,988.59	4,988.59	22.40	199.54	-163.00	-72.81	299.10	1,053.58	835.56	218.02	4.832		
5,300.00	5,095.90	5,077.90	5,077.90	23.10	203.12	-163.68	-72.81	299.10	1,097.06	875.09	221.97	4.942		
5,400.00	5,185.20	5,167.20	5,167.20	23.80	206.69	-164.31	-72.81	299.10	1,140.65	914.73	225.92	5.049		
5,500.00	5,274.50	5,256.50	5,256.50	24.50	210.26	-164.89	-72.81	299.10	1,184.35	954.48	229.88	5.152		
5,600.00	5,363.80	5,345.80	5,345.80	25.22	213.83	-165.44	-72.81	299.10	1,228.15	994.31	233.83	5.252		
5,700.00	5,453.10	5,435.10	5,435.10	25.93	217.40	-165.94	-72.81	299.10	1,272.03	1,034.24	237.79	5.349		
5,800.00	5,542.40	5,524.40	5,524.40	26.65	220.98	-166.42	-72.81	299.10	1,315.98	1,074.23	241.75	5.444		
5,900.00	5,631.71	5,613.71	5,613.71	27.38	224.55	-166.86	-72.81	299.10	1,360.00	1,114.29	245.71	5.535		
6,000.00	5,721.93	5,703.93	5,703.93	28.08	228.16	-167.53	-72.81	299.10	1,402.21	1,152.50	249.71	5.615		
6,100.00	5,814.28	5,796.28	5,796.28	28.74	231.85	-168.11	-72.81	299.10	1,439.80	1,186.01	253.79	5.673		
6,200.00	5,908.51	5,890.51	5,890.51	29.33	235.62	-168.59	-72.81	299.10	1,472.64	1,214.69	257.94	5.709		
6,300.00	6,004.36	5,986.36	5,986.36	29.88	239.45	-168.97	-72.81	299.10	1,500.60	1,238.44	262.16	5.724		
6,400.00	6,101.57	6,083.57	6,083.57	30.37	243.34	-169.27	-72.81	299.10	1,523.62	1,257.20	266.42	5.719		
6,500.00	6,199.87	6,181.87	6,181.87	30.80	247.27	-169.50	-72.81	299.10	1,541.61	1,270.89	270.72	5.695		
6,600.00	6,299.00	6,281.00	6,281.00	31.19	251.24	-169.66	-72.81	299.10	1,554.52	1,279.48	275.03	5.652		
6,700.00	6,398.67	6,380.67	6,380.67	31.52	255.23	-169.75	-72.81	299.10	1,562.31	1,282.95	279.36	5.592		
6,800.00	6,498.63	6,480.63	6,480.63	31.79	259.23	-169.79	-72.81	299.10	1,564.95	1,281.28	283.68	5.517		
6,900.00	6,598.63	6,580.63	6,580.63	32.04	263.23	49.53	-72.81	299.10	1,564.95	1,276.97	287.99	5.434		
7,000.00	6,698.63	6,680.63	6,680.63	32.29	267.23	49.53	-72.81	299.10	1,564.95	1,272.65	292.30	5.354		
7,100.00	6,798.63	6,780.63	6,780.63	32.54	271.23	49.53	-72.81	299.10	1,564.95	1,268.34	296.61	5.276		
7,200.00	6,898.63	6,880.63	6,880.63	32.80	275.23	49.53	-72.81	299.10	1,564.95	1,264.03	300.93	5.200		
7,300.00	6,998.63	6,980.63	6,980.63	33.05	279.23	49.53	-72.81	299.10	1,564.95	1,259.71	305.24	5.127		
7,400.00	7,098.63	7,080.63	7,080.63	33.31	283.23	49.53	-72.81	299.10	1,564.95	1,255.39	309.56	5.055		
7,500.00	7,198.63	7,180.63	7,180.63	33.57	287.23	49.53	-72.81	299.10	1,564.95	1,251.08	313.88	4.986		
7,600.00	7,298.63	7,280.63	7,280.63	33.83	291.23	49.53	-72.81	299.10	1,564.95	1,246.76	318.20	4.918		
7,700.00	7,398.63	7,380.63	7,380.63	34.10	295.23	49.53	-72.81	299.10	1,564.95	1,242.44	322.52	4.852		
7,800.00	7,498.63	7,480.63	7,480.63	34.36	299.23	49.53	-72.81	299.10	1,564.95	1,238.12	326.84	4.788		
7,900.00	7,598.63	7,580.63	7,580.63	34.63	303.23	49.53	-72.81	299.10	1,564.95	1,233.79	331.16	4.726		
8,000.00	7,698.63	7,680.63	7,680.63	34.90	307.23	49.53	-72.81	299.10	1,564.95	1,229.47	335.48	4.665		
8,100.00	7,798.63	7,780.63	7,780.63	35.17	311.23	49.53	-72.81	299.10	1,564.95	1,225.15	339.80	4.605		
8,200.00	7,898.63	7,880.63	7,880.63	35.44	315.23	49.53	-72.81	299.10	1,564.95	1,220.82	344.13	4.548		
8,300.00	7,998.63	7,980.63	7,980.63	35.71	319.23	49.53	-72.81	299.10	1,564.95	1,216.50	348.45	4.491		
8,400.00	8,098.63	8,080.63	8,080.63	35.99	323.23	49.53	-72.81	299.10	1,564.95	1,212.17	352.78	4.436		
8,410.00	8,108.63	8,090.63	8,090.63	36.02	323.63	49.53	-72.81	299.10	1,564.95	1,211.74	353.21	4.431		
8,500.00	8,198.63	8,115.00	8,115.00	36.26	324.60	49.53	-72.81	299.10	1,566.33	1,212.34	353.99	4.425		
8,501.37	8,200.00	8,115.00	8,115.00	36.27	324.60	49.53	-72.81	299.10	1,566.39	1,212.41	353.98	4.425		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	2.42	2,566.52	108.49	2,571.47					
100.00	100.00	0.00	0.00	0.36	0.00	2.42	2,566.52	108.49	2,568.86	2,568.50	0.36	7,155.879		
140.16	140.16	23.16	23.16	0.50	0.93	2.42	2,566.52	108.49	2,568.81	2,567.38	1.43	1,797.605		
200.00	200.00	83.00	83.00	0.72	3.32	2.42	2,566.52	108.49	2,568.81	2,564.77	4.04	636.320		
300.00	300.00	183.00	183.00	1.08	7.32	2.42	2,566.52	108.49	2,568.81	2,560.41	8.40	305.977		
400.00	400.00	283.00	283.00	1.43	11.32	2.42	2,566.52	108.49	2,568.81	2,556.05	12.75	201.414		
500.00	500.00	383.00	383.00	1.79	15.32	2.42	2,566.52	108.49	2,568.81	2,551.70	17.11	150.114		
600.00	600.00	483.00	483.00	2.15	19.32	2.42	2,566.52	108.49	2,568.81	2,547.34	21.47	119.642		
700.00	700.00	583.00	583.00	2.51	23.32	2.42	2,566.52	108.49	2,568.81	2,542.98	25.83	99.453		
800.00	800.00	683.00	683.00	2.87	27.32	2.42	2,566.52	108.49	2,568.81	2,538.62	30.19	85.094		
900.00	900.00	783.00	783.00	3.23	31.32	2.42	2,566.52	108.49	2,568.81	2,534.26	34.55	74.359		
1,000.00	1,000.00	883.00	883.00	3.58	35.32	2.42	2,566.52	108.49	2,568.81	2,529.90	38.90	66.028		
1,100.00	1,100.00	983.00	983.00	3.94	39.32	2.42	2,566.52	108.49	2,568.81	2,525.54	43.26	59.376		
1,200.00	1,200.00	1,083.00	1,083.00	4.30	43.32	2.42	2,566.52	108.49	2,568.81	2,521.19	47.62	53.942		
1,300.00	1,300.00	1,183.00	1,183.00	4.66	47.32	2.42	2,566.52	108.49	2,568.81	2,516.83	51.98	49.419		
1,400.00	1,400.00	1,283.00	1,283.00	5.02	51.32	2.42	2,566.52	108.49	2,568.81	2,512.47	56.34	45.596		
1,500.00	1,500.00	1,383.00	1,383.00	5.38	55.32	2.42	2,566.52	108.49	2,568.81	2,508.11	60.70	42.322		
1,600.00	1,600.00	1,483.00	1,483.00	5.74	59.32	2.42	2,566.52	108.49	2,568.81	2,503.75	65.06	39.486		
1,700.00	1,700.00	1,583.00	1,583.00	6.09	63.32	2.42	2,566.52	108.49	2,568.81	2,499.39	69.41	37.007		
1,800.00	1,800.00	1,683.00	1,683.00	6.45	67.32	2.42	2,566.52	108.49	2,568.81	2,495.04	73.77	34.821		
1,900.00	1,900.00	1,783.00	1,783.00	6.81	71.32	2.42	2,566.52	108.49	2,568.81	2,490.68	78.13	32.878		
2,000.00	2,000.00	1,883.00	1,883.00	7.17	75.32	2.42	2,566.52	108.49	2,568.81	2,486.32	82.49	31.141		
2,100.00	2,100.00	1,983.00	1,983.00	7.53	79.32	2.42	2,566.52	108.49	2,568.81	2,481.96	86.85	29.578		
2,200.00	2,200.00	2,083.00	2,083.00	7.89	83.32	2.42	2,566.52	108.49	2,568.81	2,477.60	91.21	28.165		
2,300.00	2,300.00	2,183.00	2,183.00	8.24	87.32	2.42	2,566.52	108.49	2,568.81	2,473.24	95.56	26.880		
2,400.00	2,400.00	2,283.00	2,283.00	8.60	91.32	2.42	2,566.52	108.49	2,568.81	2,468.88	99.92	25.708		
2,500.00	2,500.00	2,383.00	2,383.00	8.96	95.32	2.42	2,566.52	108.49	2,568.81	2,464.53	104.28	24.633		
2,600.00	2,600.00	2,483.00	2,483.00	9.32	99.32	2.42	2,566.52	108.49	2,568.81	2,460.17	108.64	23.645		
2,700.00	2,700.00	2,583.00	2,583.00	9.68	103.32	2.42	2,566.52	108.49	2,568.81	2,455.81	113.00	22.733		
2,800.00	2,800.00	2,683.00	2,683.00	10.04	107.32	2.42	2,566.52	108.49	2,568.81	2,451.45	117.36	21.889 CC		
2,900.00	2,899.95	2,782.95	2,782.95	10.38	111.32	143.10	2,566.52	108.49	2,570.90	2,449.20	121.70	21.125 ES		
3,000.00	2,999.63	2,882.63	2,882.63	10.71	115.31	143.09	2,566.52	108.49	2,577.18	2,451.17	126.01	20.452		
3,100.00	3,098.77	2,981.77	2,981.77	11.04	119.27	143.07	2,566.52	108.49	2,587.65	2,457.34	130.31	19.858		
3,200.00	3,197.08	3,080.08	3,080.08	11.37	123.20	143.05	2,566.52	108.49	2,602.30	2,467.73	134.57	19.337		
3,300.00	3,294.31	3,177.31	3,177.31	11.72	127.09	143.01	2,566.52	108.49	2,621.14	2,482.34	138.80	18.884		
3,400.00	3,390.18	3,273.18	3,273.18	12.08	130.93	142.95	2,566.52	108.49	2,644.16	2,501.18	142.97	18.494		
3,500.00	3,484.43	3,367.43	3,367.43	12.46	134.70	142.86	2,566.52	108.49	2,671.34	2,524.25	147.09	18.162		
3,600.00	3,576.81	3,459.81	3,459.81	12.87	138.39	142.74	2,566.52	108.49	2,702.67	2,551.54	151.13	17.883		
3,700.00	3,667.07	3,550.07	3,550.07	13.31	142.00	142.64	2,566.52	108.49	2,738.12	2,583.01	155.10	17.653		
3,800.00	3,756.37	3,639.37	3,639.37	13.79	145.57	143.19	2,566.52	108.49	2,775.42	2,616.38	159.04	17.451		
3,900.00	3,845.67	3,728.67	3,728.67	14.29	149.15	143.72	2,566.52	108.49	2,812.94	2,649.96	162.99	17.259		
4,000.00	3,934.97	3,817.97	3,817.97	14.82	152.72	144.23	2,566.52	108.49	2,850.68	2,683.74	166.94	17.076		
4,100.00	4,024.27	3,907.27	3,907.27	15.37	156.29	144.74	2,566.52	108.49	2,888.63	2,717.73	170.90	16.902		
4,200.00	4,113.58	3,996.58	3,996.58	15.94	159.86	145.23	2,566.52	108.49	2,926.78	2,751.91	174.87	16.737		
4,300.00	4,202.88	4,085.88	4,085.88	16.53	163.44	145.71	2,566.52	108.49	2,965.13	2,786.28	178.85	16.579		
4,400.00	4,292.18	4,175.18	4,175.18	17.14	167.01	146.18	2,566.52	108.49	3,003.65	2,820.82	182.83	16.429		
4,500.00	4,381.48	4,264.48	4,264.48	17.76	170.58	146.63	2,566.52	108.49	3,042.36	2,855.54	186.81	16.286		
4,600.00	4,470.78	4,353.78	4,353.78	18.39	174.15	147.08	2,566.52	108.49	3,081.23	2,890.43	190.80	16.149		
4,700.00	4,560.08	4,443.08	4,443.08	19.04	177.72	147.51	2,566.52	108.49	3,120.27	2,925.48	194.79	16.018		
4,800.00	4,649.39	4,532.39	4,532.39	19.69	181.30	147.94	2,566.52	108.49	3,159.47	2,960.68	198.79	15.894		
4,900.00	4,738.69	4,621.69	4,621.69	20.36	184.87	148.36	2,566.52	108.49	3,198.82	2,996.04	202.78	15.775		
5,000.00	4,827.99	4,710.99	4,710.99	21.03	188.44	148.76	2,566.52	108.49	3,238.32	3,031.54	206.78	15.661		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.00	4,917.29	4,800.29	4,800.29	21.71	192.01	149.16	2,566.52	108.49	3,277.96	3,067.18	210.78	15.551		
5,200.00	5,006.59	4,889.59	4,889.59	22.40	195.58	149.55	2,566.52	108.49	3,317.74	3,102.96	214.78	15.447		
5,300.00	5,095.90	4,978.90	4,978.90	23.10	199.16	149.93	2,566.52	108.49	3,357.65	3,138.86	218.79	15.347		
5,400.00	5,185.20	5,068.20	5,068.20	23.80	202.73	150.30	2,566.52	108.49	3,397.69	3,174.90	222.79	15.251		
5,500.00	5,274.50	5,157.50	5,157.50	24.50	206.30	150.66	2,566.52	108.49	3,437.85	3,211.05	226.79	15.159		
5,600.00	5,363.80	5,246.80	5,246.80	25.22	209.87	151.01	2,566.52	108.49	3,478.12	3,247.33	230.80	15.070		
5,700.00	5,453.10	5,336.10	5,336.10	25.93	213.44	151.36	2,566.52	108.49	3,518.52	3,283.71	234.80	14.985		
5,800.00	5,542.40	5,425.40	5,425.40	26.65	217.02	151.70	2,566.52	108.49	3,559.02	3,320.21	238.81	14.903		
5,900.00	5,631.71	5,514.71	5,514.71	27.38	220.59	152.03	2,566.52	108.49	3,599.63	3,356.81	242.81	14.825		
6,000.00	5,721.93	5,604.93	5,604.93	28.08	224.20	152.87	2,566.52	108.49	3,638.61	3,391.76	246.85	14.740		
6,100.00	5,814.28	5,697.28	5,697.28	28.74	227.89	153.63	2,566.52	108.49	3,673.36	3,422.40	250.97	14.637		
6,200.00	5,908.51	5,791.51	5,791.51	29.33	231.66	154.28	2,566.52	108.49	3,703.74	3,448.60	255.14	14.516		
6,300.00	6,004.36	5,887.36	5,887.36	29.88	235.49	154.81	2,566.52	108.49	3,729.64	3,470.27	259.37	14.380		
6,400.00	6,101.57	5,984.57	5,984.57	30.37	239.38	155.24	2,566.52	108.49	3,750.97	3,487.33	263.64	14.228		
6,500.00	6,199.87	6,082.87	6,082.87	30.80	243.31	155.57	2,566.52	108.49	3,767.65	3,499.72	267.94	14.062		
6,600.00	6,299.00	6,182.00	6,182.00	31.19	247.28	155.80	2,566.52	108.49	3,779.63	3,507.38	272.25	13.883		
6,700.00	6,398.67	6,281.67	6,281.67	31.52	251.27	155.94	2,566.52	108.49	3,786.86	3,510.29	276.57	13.692		
6,800.00	6,498.63	6,381.63	6,381.63	31.79	255.27	155.98	2,566.52	108.49	3,789.32	3,508.44	280.88	13.491		
6,900.00	6,598.63	6,481.63	6,481.63	32.04	259.27	15.30	2,566.52	108.49	3,789.32	3,504.14	285.18	13.288		
7,000.00	6,698.63	6,581.63	6,581.63	32.29	263.27	15.30	2,566.52	108.49	3,789.32	3,499.84	289.48	13.090		
7,100.00	6,798.63	6,681.63	6,681.63	32.54	267.27	15.30	2,566.52	108.49	3,789.32	3,495.53	293.79	12.898		
7,200.00	6,898.63	6,781.63	6,781.63	32.80	271.27	15.30	2,566.52	108.49	3,789.32	3,491.22	298.09	12.712		
7,300.00	6,998.63	6,881.63	6,881.63	33.05	275.27	15.30	2,566.52	108.49	3,789.32	3,486.92	302.40	12.531		
7,400.00	7,098.63	6,981.63	6,981.63	33.31	279.27	15.30	2,566.52	108.49	3,789.32	3,482.61	306.71	12.355		
7,500.00	7,198.63	7,081.63	7,081.63	33.57	283.27	15.30	2,566.52	108.49	3,789.32	3,478.30	311.02	12.184		
7,600.00	7,298.63	7,181.63	7,181.63	33.83	287.27	15.30	2,566.52	108.49	3,789.32	3,473.99	315.33	12.017		
7,700.00	7,398.63	7,281.63	7,281.63	34.10	291.27	15.30	2,566.52	108.49	3,789.32	3,469.68	319.64	11.855		
7,800.00	7,498.63	7,381.63	7,381.63	34.36	295.27	15.30	2,566.52	108.49	3,789.32	3,465.36	323.95	11.697		
7,900.00	7,598.63	7,481.63	7,481.63	34.63	299.27	15.30	2,566.52	108.49	3,789.32	3,461.05	328.27	11.543		
8,000.00	7,698.63	7,581.63	7,581.63	34.90	303.27	15.30	2,566.52	108.49	3,789.32	3,456.73	332.58	11.394		
8,100.00	7,798.63	7,681.63	7,681.63	35.17	307.27	15.30	2,566.52	108.49	3,789.32	3,452.42	336.90	11.248		
8,200.00	7,898.63	7,781.63	7,781.63	35.44	311.27	15.30	2,566.52	108.49	3,789.32	3,448.10	341.22	11.105		
8,300.00	7,998.63	7,881.63	7,881.63	35.71	315.27	15.30	2,566.52	108.49	3,789.32	3,443.78	345.54	10.967		
8,400.00	8,098.63	7,981.63	7,981.63	35.99	319.27	15.30	2,566.52	108.49	3,789.32	3,439.46	349.85	10.831		
8,500.00	8,198.63	7,990.00	7,990.00	36.26	319.60	15.30	2,566.52	108.49	3,790.42	3,440.11	350.31	10.820 SF		
8,501.37	8,200.00	7,990.00	7,990.00	36.27	319.60	15.30	2,566.52	108.49	3,790.46	3,440.14	350.31	10.820		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-93.95	-87.34	-1,263.86	1,266.93					
100.00	100.00	88.00	88.00	0.36	3.52	-93.95	-87.34	-1,263.86	1,266.88	1,263.00	3.88	326.641		
200.00	200.00	188.00	188.00	0.72	7.52	-93.95	-87.34	-1,263.86	1,266.88	1,258.64	8.24	153.804		
300.00	300.00	288.00	288.00	1.08	11.52	-93.95	-87.34	-1,263.86	1,266.88	1,254.28	12.60	100.582		
400.00	400.00	388.00	388.00	1.43	15.52	-93.95	-87.34	-1,263.86	1,266.88	1,249.92	16.95	74.725		
500.00	500.00	488.00	488.00	1.79	19.52	-93.95	-87.34	-1,263.86	1,266.88	1,245.56	21.31	59.443		
600.00	600.00	588.00	588.00	2.15	23.52	-93.95	-87.34	-1,263.86	1,266.88	1,241.21	25.67	49.351		
700.00	700.00	688.00	688.00	2.51	27.52	-93.95	-87.34	-1,263.86	1,266.88	1,236.85	30.03	42.188		
800.00	800.00	788.00	788.00	2.87	31.52	-93.95	-87.34	-1,263.86	1,266.88	1,232.49	34.39	36.841		
900.00	900.00	888.00	888.00	3.23	35.52	-93.95	-87.34	-1,263.86	1,266.88	1,228.13	38.75	32.697		
1,000.00	1,000.00	988.00	988.00	3.58	39.52	-93.95	-87.34	-1,263.86	1,266.88	1,223.77	43.10	29.391		
1,100.00	1,100.00	1,088.00	1,088.00	3.94	43.52	-93.95	-87.34	-1,263.86	1,266.88	1,219.41	47.46	26.692		
1,200.00	1,200.00	1,188.00	1,188.00	4.30	47.52	-93.95	-87.34	-1,263.86	1,266.88	1,215.06	51.82	24.447		
1,300.00	1,300.00	1,288.00	1,288.00	4.66	51.52	-93.95	-87.34	-1,263.86	1,266.88	1,210.70	56.18	22.550		
1,400.00	1,400.00	1,388.00	1,388.00	5.02	55.52	-93.95	-87.34	-1,263.86	1,266.88	1,206.34	60.54	20.927		
1,500.00	1,500.00	1,488.00	1,488.00	5.38	59.52	-93.95	-87.34	-1,263.86	1,266.88	1,201.98	64.90	19.521		
1,600.00	1,600.00	1,588.00	1,588.00	5.74	63.52	-93.95	-87.34	-1,263.86	1,266.88	1,197.62	69.26	18.293		
1,700.00	1,700.00	1,688.00	1,688.00	6.09	67.52	-93.95	-87.34	-1,263.86	1,266.88	1,193.26	73.61	17.210		
1,800.00	1,800.00	1,788.00	1,788.00	6.45	71.52	-93.95	-87.34	-1,263.86	1,266.88	1,188.90	77.97	16.248		
1,900.00	1,900.00	1,888.00	1,888.00	6.81	75.52	-93.95	-87.34	-1,263.86	1,266.88	1,184.55	82.33	15.388		
2,000.00	2,000.00	1,988.00	1,988.00	7.17	79.52	-93.95	-87.34	-1,263.86	1,266.88	1,180.19	86.69	14.614		
2,100.00	2,100.00	2,088.00	2,088.00	7.53	83.52	-93.95	-87.34	-1,263.86	1,266.88	1,175.83	91.05	13.914		
2,200.00	2,200.00	2,188.00	2,188.00	7.89	87.52	-93.95	-87.34	-1,263.86	1,266.88	1,171.47	95.41	13.279		
2,300.00	2,300.00	2,288.00	2,288.00	8.24	91.52	-93.95	-87.34	-1,263.86	1,266.88	1,167.11	99.76	12.699		
2,400.00	2,400.00	2,388.00	2,388.00	8.60	95.52	-93.95	-87.34	-1,263.86	1,266.88	1,162.75	104.12	12.167		
2,500.00	2,500.00	2,488.00	2,488.00	8.96	99.52	-93.95	-87.34	-1,263.86	1,266.88	1,158.40	108.48	11.678		
2,600.00	2,600.00	2,588.00	2,588.00	9.32	103.52	-93.95	-87.34	-1,263.86	1,266.88	1,154.04	112.84	11.227		
2,700.00	2,700.00	2,688.00	2,688.00	9.68	107.52	-93.95	-87.34	-1,263.86	1,266.88	1,149.68	117.20	10.810		
2,800.00	2,800.00	2,788.00	2,788.00	10.04	111.52	-93.95	-87.34	-1,263.86	1,266.88	1,145.32	121.56	10.422		
2,900.00	2,899.95	2,887.95	2,887.95	10.38	115.52	46.85	-87.34	-1,263.86	1,265.08	1,139.19	125.90	10.049		
3,000.00	2,999.63	2,987.63	2,987.63	10.71	119.51	47.23	-87.34	-1,263.86	1,259.73	1,129.52	130.21	9.675		
3,100.00	3,098.77	3,086.77	3,086.77	11.04	123.47	47.87	-87.34	-1,263.86	1,250.88	1,116.37	134.50	9.300		
3,200.00	3,197.08	3,185.08	3,185.08	11.37	127.40	48.76	-87.34	-1,263.86	1,238.64	1,099.88	138.76	8.926		
3,300.00	3,294.31	3,282.31	3,282.31	11.72	131.29	49.93	-87.34	-1,263.86	1,223.19	1,080.20	142.99	8.554		
3,400.00	3,390.18	3,378.18	3,378.18	12.08	135.13	51.38	-87.34	-1,263.86	1,204.73	1,057.56	147.16	8.186		
3,500.00	3,484.43	3,472.43	3,472.43	12.46	138.90	53.11	-87.34	-1,263.86	1,183.54	1,032.25	151.29	7.823		
3,600.00	3,576.81	3,564.81	3,564.81	12.87	142.59	55.14	-87.34	-1,263.86	1,159.95	1,004.58	155.36	7.466		
3,700.00	3,667.07	3,655.07	3,655.07	13.31	146.20	57.41	-87.34	-1,263.86	1,134.37	975.00	159.38	7.118		
3,800.00	3,756.37	3,744.37	3,744.37	13.79	149.77	59.22	-87.34	-1,263.86	1,108.78	945.40	163.38	6.786		
3,900.00	3,845.67	3,833.67	3,833.67	14.29	153.35	61.10	-87.34	-1,263.86	1,084.46	917.04	167.42	6.477		
4,000.00	3,934.97	3,922.97	3,922.97	14.82	156.92	63.05	-87.34	-1,263.86	1,061.49	889.99	171.50	6.190		
4,100.00	4,024.27	4,012.27	4,012.27	15.37	160.49	65.07	-87.34	-1,263.86	1,039.96	864.35	175.60	5.922		
4,200.00	4,113.58	4,101.58	4,101.58	15.94	164.06	67.15	-87.34	-1,263.86	1,019.96	840.22	179.74	5.675		
4,300.00	4,202.88	4,190.88	4,190.88	16.53	167.64	69.30	-87.34	-1,263.86	1,001.58	817.67	183.91	5.446		
4,400.00	4,292.18	4,280.18	4,280.18	17.14	171.21	71.52	-87.34	-1,263.86	984.92	796.82	188.10	5.236		
4,500.00	4,381.48	4,369.48	4,369.48	17.76	174.78	73.79	-87.34	-1,263.86	970.06	777.74	192.32	5.044		
4,600.00	4,470.78	4,458.78	4,458.78	18.39	178.35	76.12	-87.34	-1,263.86	957.09	760.53	196.56	4.869		
4,700.00	4,560.08	4,548.08	4,548.08	19.04	181.92	78.50	-87.34	-1,263.86	946.09	745.27	200.82	4.711		
4,800.00	4,649.39	4,637.39	4,637.39	19.69	185.50	80.91	-87.34	-1,263.86	937.11	732.02	205.09	4.569		
4,900.00	4,738.69	4,726.69	4,726.69	20.36	189.07	83.36	-87.34	-1,263.86	930.23	720.87	209.37	4.443		
5,000.00	4,827.99	4,815.99	4,815.99	21.03	192.64	85.84	-87.34	-1,263.86	925.50	711.85	213.64	4.332		
5,100.00	4,917.29	4,905.29	4,905.29	21.71	196.21	88.32	-87.34	-1,263.86	922.93	705.01	217.92	4.235		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,167.13	4,977.24	4,965.24	4,965.24	22.18	198.61	90.00	-87.34	-1,263.86	922.43	701.65	220.79	4.178	CC	
5,200.00	5,006.59	4,994.59	4,994.59	22.40	199.78	90.82	-87.34	-1,263.86	922.55	700.37	222.19	4.152		
5,300.00	5,095.90	5,083.90	5,083.90	23.10	203.36	93.31	-87.34	-1,263.86	924.37	697.93	226.44	4.082		
5,400.00	5,185.20	5,173.20	5,173.20	23.80	206.93	95.79	-87.34	-1,263.86	928.37	697.69	230.68	4.025	ES	
5,500.00	5,274.50	5,262.50	5,262.50	24.50	210.50	98.25	-87.34	-1,263.86	934.52	699.62	234.89	3.978		
5,600.00	5,363.80	5,351.80	5,351.80	25.22	214.07	100.68	-87.34	-1,263.86	942.78	703.69	239.09	3.943		
5,700.00	5,453.10	5,441.10	5,441.10	25.93	217.64	103.07	-87.34	-1,263.86	953.09	709.84	243.26	3.918		
5,800.00	5,542.40	5,530.40	5,530.40	26.65	221.22	105.41	-87.34	-1,263.86	965.40	718.00	247.40	3.902		
5,900.00	5,631.71	5,619.71	5,619.71	27.38	224.79	107.71	-87.34	-1,263.86	979.62	728.10	251.52	3.895		
6,000.00	5,721.93	5,709.93	5,709.93	28.08	228.40	110.26	-87.34	-1,263.86	994.95	739.31	255.64	3.892		
6,100.00	5,814.28	5,802.28	5,802.28	28.74	232.09	112.59	-87.34	-1,263.86	1,009.95	750.15	259.79	3.888		
6,200.00	5,908.51	5,896.51	5,896.51	29.33	235.86	114.62	-87.34	-1,263.86	1,024.02	760.04	263.98	3.879		
6,300.00	6,004.36	5,992.36	5,992.36	29.88	239.69	116.35	-87.34	-1,263.86	1,036.70	768.50	268.20	3.865		
6,400.00	6,101.57	6,089.57	6,089.57	30.37	243.58	117.76	-87.34	-1,263.86	1,047.59	775.15	272.44	3.845		
6,500.00	6,199.87	6,187.87	6,187.87	30.80	247.51	118.86	-87.34	-1,263.86	1,056.38	779.69	276.70	3.818		
6,600.00	6,299.00	6,287.00	6,287.00	31.19	251.48	119.65	-87.34	-1,263.86	1,062.84	781.87	280.97	3.783		
6,700.00	6,398.67	6,386.67	6,386.67	31.52	255.47	120.12	-87.34	-1,263.86	1,066.80	781.55	285.25	3.740		
6,800.00	6,498.63	6,486.63	6,486.63	31.79	259.47	120.28	-87.34	-1,263.86	1,068.15	778.63	289.52	3.689		
6,900.00	6,598.63	6,586.63	6,586.63	32.04	263.47	-20.40	-87.34	-1,263.86	1,068.15	774.37	293.78	3.636		
7,000.00	6,698.63	6,686.63	6,686.63	32.29	267.47	-20.40	-87.34	-1,263.86	1,068.15	770.10	298.05	3.584		
7,100.00	6,798.63	6,786.63	6,786.63	32.54	271.47	-20.40	-87.34	-1,263.86	1,068.15	765.84	302.31	3.533		
7,200.00	6,898.63	6,886.63	6,886.63	32.80	275.47	-20.40	-87.34	-1,263.86	1,068.15	761.57	306.58	3.484		
7,300.00	6,998.63	6,986.63	6,986.63	33.05	279.47	-20.40	-87.34	-1,263.86	1,068.15	757.30	310.85	3.436		
7,400.00	7,098.63	7,086.63	7,086.63	33.31	283.47	-20.40	-87.34	-1,263.86	1,068.15	753.03	315.12	3.390		
7,500.00	7,198.63	7,186.63	7,186.63	33.57	287.47	-20.40	-87.34	-1,263.86	1,068.15	748.75	319.40	3.344		
7,600.00	7,298.63	7,286.63	7,286.63	33.83	291.47	-20.40	-87.34	-1,263.86	1,068.15	744.48	323.67	3.300		
7,700.00	7,398.63	7,386.63	7,386.63	34.10	295.47	-20.40	-87.34	-1,263.86	1,068.15	740.20	327.95	3.257		
7,800.00	7,498.63	7,486.63	7,486.63	34.36	299.47	-20.40	-87.34	-1,263.86	1,068.15	735.92	332.23	3.215		
7,900.00	7,598.63	7,586.63	7,586.63	34.63	303.47	-20.40	-87.34	-1,263.86	1,068.15	731.64	336.51	3.174		
8,000.00	7,698.63	7,686.63	7,686.63	34.90	307.47	-20.40	-87.34	-1,263.86	1,068.15	727.36	340.79	3.134		
8,100.00	7,798.63	7,786.63	7,786.63	35.17	311.47	-20.40	-87.34	-1,263.86	1,068.15	723.08	345.07	3.095		
8,200.00	7,898.63	7,886.63	7,886.63	35.44	315.47	-20.40	-87.34	-1,263.86	1,068.15	718.79	349.36	3.057		
8,300.00	7,998.63	7,986.63	7,986.63	35.71	319.47	-20.40	-87.34	-1,263.86	1,068.15	714.50	353.64	3.020		
8,309.53	8,008.16	7,996.16	7,996.16	35.74	319.85	-20.40	-87.34	-1,263.86	1,068.15	714.10	354.05	3.017		
8,400.00	8,098.63	8,086.63	8,086.63	35.99	322.76	-20.40	-87.34	-1,263.86	1,068.29	711.15	357.15	2.991	SF	
8,500.00	8,198.63	8,069.00	8,069.00	36.26	322.76	-20.40	-87.34	-1,263.86	1,074.61	719.40	355.20	3.025		
8,501.37	8,200.00	8,069.00	8,069.00	36.27	322.76	-20.40	-87.34	-1,263.86	1,074.76	719.60	355.16	3.026		

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



Scientific Drilling Anticollision Report



Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6833' @ 6833.00ft

Offset Depths are relative to Offset Datum

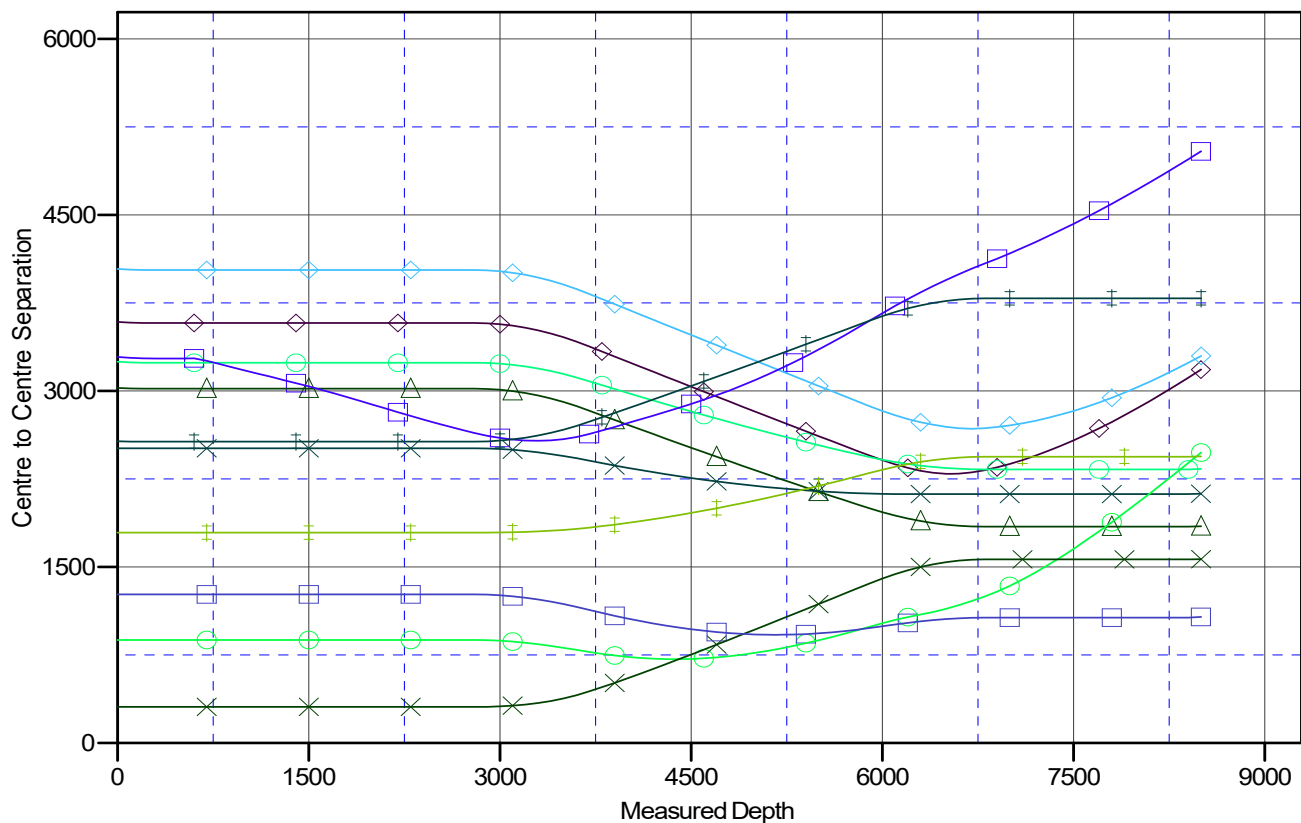
Central Meridian is -107.8333334

Coordinates are relative to: San Juan 29-7 Unit NP 516

Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30

Grid Convergence at Surface is: 0.18°

Ladder Plot



LEGEND

- | | | |
|------------------------------------|------------------------------------|------------------------------------|
| ◆ San Juan 28-7 UN 055, OH, OH V0 | ○ San Juan 29-7 UN 030A, OH, OH V0 | ✕ San Juan 29-7 UN 106, OH, OH V0 |
| ◆ San Juan 28-7 UN 074A, OH, OH V0 | ○ San Juan 29-7 UN 068, OH, OH V0 | ✕ San Juan 29-7 UN 106M, OH, OH V0 |
| ▲ San Juan 28-7 UN 218, OH, OH V0 | □ San Juan 29-7 UN 105E, OH, OH V0 | □ San Juan 29-7 UN 106N, OH, OH V0 |
| ✕ San Juan 28-7 UN 218M, OH, OH V0 | ✕ San Juan 29-7 UN 105M, OH, OH V0 | |

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



Scientific Drilling Anticollision Report

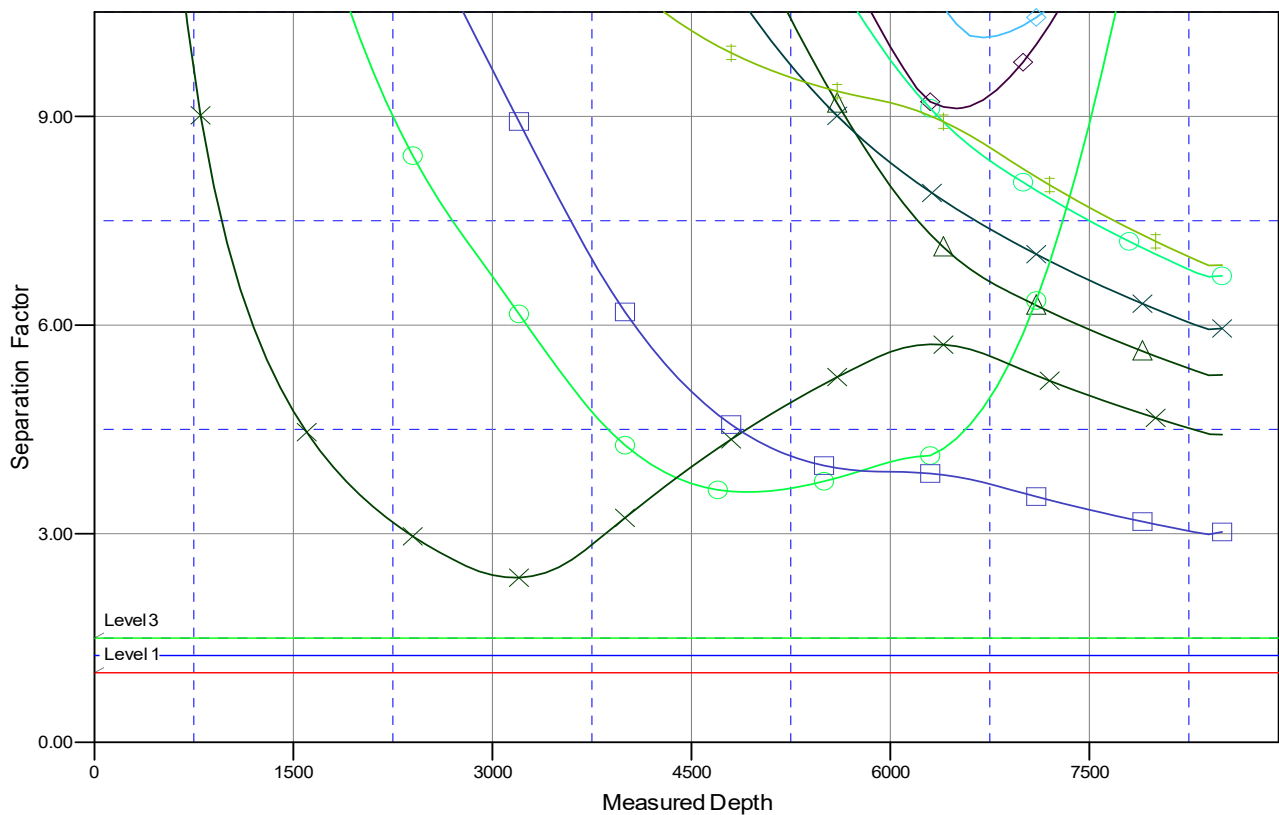


Company:	Hilcorp Energy Corp.	Local Co-ordinate Reference:	Well San Juan 29-7 Unit NP 516
Project:	Rio Arriba, NM NAD27	TVD Reference:	GL 6833' @ 6833.00ft
Reference Site:	San Juan 29-7 Unit NP 516 Pad	MD Reference:	GL 6833' @ 6833.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	San Juan 29-7 Unit NP 516	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6833' @ 6833.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -107.8333334

Coordinates are relative to: San Juan 29-7 Unit NP 516
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.18°

Separation Factor Plot



LEGEND

- | | | |
|------------------------------------|------------------------------------|------------------------------------|
| ◆ San Juan 28-7 UN 055, OH, OH V0 | ○ San Juan 29-7 UN 030A, OH, OH V0 | ✕ San Juan 29-7 UN 106, OH, OH V0 |
| ◆ San Juan 28-7 UN 074A, OH, OH V0 | ○ San Juan 29-7 UN 068, OH, OH V0 | ✕ San Juan 29-7 UN 106M, OH, OH V0 |
| ▲ San Juan 28-7 UN 218, OH, OH V0 | □ San Juan 29-7 UN 105E, OH, OH V0 | □ San Juan 29-7 UN 106N, OH, OH V0 |
| ✕ San Juan 28-7 UN 218M, OH, OH V0 | ◆ San Juan 29-7 UN 105M, OH, OH V0 | |

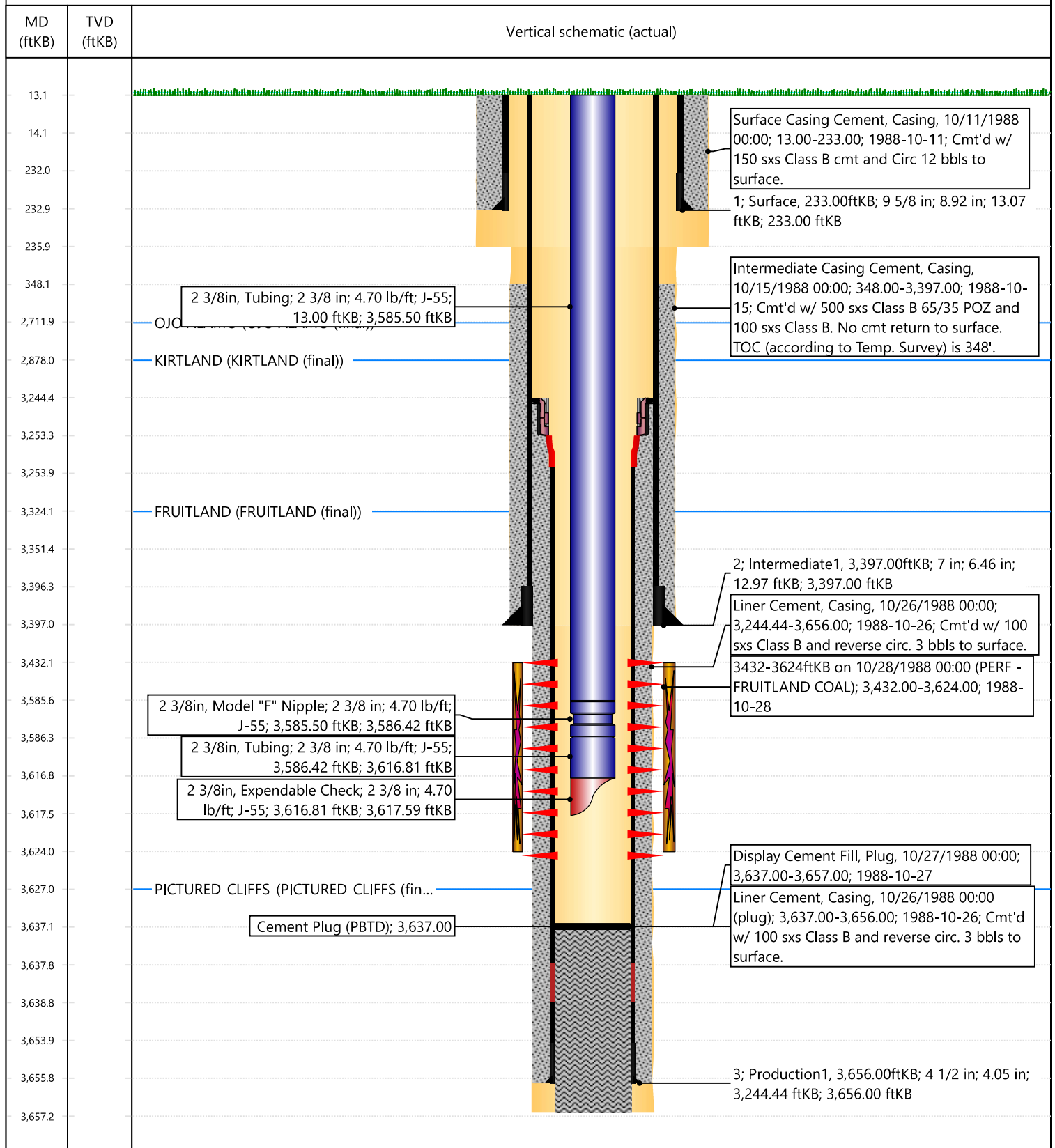


Current Schematic - Version 3

Well Name: SAN JUAN 29-7 UNIT NP #516

API / UWI 3003924294	Surface Legal Location 036-029N-007W-K	Field Name BASIN (FRUITLAND COAL)	Route 1008	State/Province NEW MEXICO	Well Configuration Type VERTICAL
Ground Elevation (ft) 6,816.00	Original KB/RT Elevation (ft) 6,829.00	Tubing Hanger Elevation (ft)	RKB to GL (ft) 13.00	KB-Casing Flange Distance (ft)	KB-Tubing Hanger Distance (ft)

Original Hole [VERTICAL]



San Juan 29-7 Unit NP 516 - Proposed Wellbore Schematic

sand/casing	MD	TVD	PP						Hole size	MW
									12.25	water
									Existing	
9.625" Existing		233	233							
									8.75	
OJO_ALAMO_TOP		2412	2412							
KIRTLAND		2609	2609	8.8						
FRUITLAND *		2945	2945	8.8						
7" Existing		3393	Existing							
									6.125	8.4
Pictured Cliffs		3561	3360							
Chacra		4502	4328							
Upper Cliff House		5226	5106							
Mefee		5336	5190							
Pt Lookout		5731	5523							
El Vado		6955	6769							
Juana Lopez		7396	7210							
Greenhorn		7691	7505						TOC = 3457	
Graneros		7718	7556						564 sxs at 13.0 ppg	1.44 ft^3/sx
Dakota		7742	7742							
Cubero		7907	7721							
Cubero L		7923	7754							
Encinal		8022	7836							9.2
4.5		8286	8100							
All depth are from KB										
OD	\$/ft	Depth	Cxn	Wt	Grade	ID	Drift	Capacity	Displacement	
									Closed	Open
9.625	na	233	STC	36	H40	8.921	8.765	0.077311	0.089995	0.01268349
7	na	3416	LTC	23	J55	6.366	6.241	0.039369	0.047601	0.00823202
4.5		8286	LTC	11.6	J55	4	3.875	0.015543	0.019672	0.00412862
OD	Burst	SF	Collapse	SF	Tension					
					Body	SF	jt	SF		
9.625	2550	1.6	1720	18.3	410	3.8	294	2.7		
7	4350	1.4	3270	1.9	366	2.0	313	1.7		
4.5	5350	2.4	4960	1.3	184	1.3	180	1.3		

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description **Effective May 25, 2021**

I. Operator: Hilcorp Energy Company **OGRID:** 372171 **Date:** 7 / 02 / 2024

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
San Juan 29-7 Unit NP 516	3003924294	K-36-29N-07W	1720' FSL, 1540' FWL	2.42	930	1.5

IV. Central Delivery Point Name: Chaco-Blanco Processing Plant [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
<u>San Juan 29-7 Unit NP 516</u>	<u>3003924294</u>	<u>2024-2025</u>				<u>2024-2025</u>

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

If Operator checks this box, Operator will select one of the following:

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature: Cherylene Weston

Printed Name: Cherylene Weston

Title: Operations Regulatory Tech-Sr.

E-mail Address: cweston@hilcorp.com

Date: 07/02/2024

Phone: 713-289-2615

OIL CONSERVATION DIVISION
(Only applicable when submitted as a standalone form)

Approved By:

Title:

Approval Date:

Conditions of Approval:

Hilcorp Energy Natural Gas Management Plan Attachments

VI. Separation Equipment

The operator will select separation equipment for the maximum anticipated throughput and pressure to optimize gas capture. Separation equipment is sized according to manufacturer's design specifications. Separation vessels are built following the A.S.M.E. section VIII division 1 codes for pressure vessel design, fabrication, inspection, testing and certification. Anticipated well pressures and production rates are evaluated to select separation equipment according to the equipment's designed operating pressure and throughput.

After completion, the operator utilizes flowback equipment, including separators, to manage wellbore fluids and solids during the initial separation period. After the initial flowback period is complete the operator utilizes iterative facility separation equipment to ensure that optimal separation is achieved.

VII. Operational Practices 19.15.27.8 NMAC A through F

- A. The operator will maximize the recovery of natural gas and minimize the amount of gas vented or flared when technically and safely feasible as further described and detailed within the following subsections (B-F of 19.15.27.8). In all cases where natural gas venting and flaring requires regulatory reporting, reporting will be submitted accurately and within the required time frames.
- B. Venting and flaring during drilling operations:
 - a. New Drill HZ Gas Wells: The operator drills wells in the area by utilizing a balanced mud to safely drill the wellbore. This technique prevents gas from coming to surface during the drilling process. If there is an emergency or malfunction and natural gas does come to surface the natural gas will be captured and routed to sales if technically and safely feasible.
- C. Venting and flaring during completion or recompletion operations:
 - a. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. The natural gas will be utilized on site as needed for fuel gas and natural gas will be sold.
- D. Venting and flaring during production operations:
 - a. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible.

Operations will effectively manage the following scenarios to minimize the quantity of natural gas that is vented or flared:

- (a) If there is an emergency or malfunction vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore needs to be unloaded to atmosphere the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low pressure vessel. The formation is only anticipated to produce water and therefore tank emissions are anticipated to be negligible.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will always utilize the water transfer systems when available. Water loading emissions are anticipated to be negligible.
- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) No dehydration or amine units are anticipated to be set on location.
- (h) Compressors, compressor engines, turbines, flanges, connectors, valves, storage tanks, and other low-pressure vessels and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operations.
- (i) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
- (j) If natural gas does not meet gathering pipeline specifications gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
- (k) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

E. Performance standards:

- a. The production facilities are designed to handle the maximum throughput and pressures from producing wellbores and will be designed to minimize waste. The amount of gas vented and flared will be minimized when technically and safely feasible.
 - b. All tanks that are routed to a control device that is installed after 5/25/2021 will have an automatic gauging system to minimize the amount of vented natural gas.
 - c. If a flare stack is installed or replaced after 5/25/2021 it will be equipped with an automatic ignitor or continuous pilot. The flare stack will be properly sized and designed to ensure proper combustion efficiency. The flare stack will be located 100 feet away from the nearest wellhead or storage tank.
 - d. AVO inspections will be conducted weekly for the year after completion and for all wells producing greater than 60,000 cubic feet of natural gas daily. The AVO inspection will include all components, including flare stacks, thief hatches, closed vent systems, pumps, compressors, pressure relief devices, valves, lines, flanges, connectors, and associated pipeline to identify any leaks and releases by comprehensive auditory, visual, and olfactory inspection. The AVO inspection records will be maintained for 5 years which will be available at the department's request. Identified leaks will be repaired as soon as feasible to minimize the amount of vented natural gas.
- F. Measurement or estimation of vented and flared natural gas.
- a. The volume of natural gas that is vented, flared or consumed for beneficial use will be measured when possible, or estimated, during drilling, completions, or production operations.
 - b. Equipment will be installed to measure the volume of natural gas flared for all APD's issued after 5/25/2021 on facilities that will have an average daily gas rate greater than 60,000 cubic feet of natural gas. Measurement equipment will conform to API MPMS Chapter 14.10 regulations. The measurement equipment will not have a manifold that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing the measurement equipment. If metering is not practical then the volume of gas will be estimated.

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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 363053

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 363053
	Action Type: [C-101] Drilling Non-Federal/Indian (APD)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	Notify OCD 24 hours prior to casing & cement	8/1/2024
ward.rikala	Will require a File As Drilled C-102 and a Directional Survey with the C-104	8/1/2024
ward.rikala	If cement does not circulate on any string, a CBL is required for that string of casing	8/1/2024
ward.rikala	Must squeeze off existing perforations and test casing and successfully hold pressure for 30 min before drilling out	8/1/2024
ward.rikala	Before the well can be produced, must has approved DHC permit.	8/1/2024