

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2.

1. Type of Well

☐ Oil Well

☒ Gas Well

☐ Other

2. Name of Operator

Hilcorp Energy Company

3a. Address

PO Box 4700, Farmington, NM 87499

3b. Phone No. (include area code)

505-599-3400

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Surface

Unit I (NESE) 1591' FSL & 776' FEL, Sec. 9, T32N, R07W

Bottomhole (Lat 1)

Unit E (SWNW) 660' FNL & 660' FWL, Sec. 11, T32N, R07W

Bottomhole (Lat 2)

Unit L (NWSW) 2724' FSL & 1293' FWL, Sec. 11, T32N, R07W

5. Lease Serial No.

SF-078459-B

6. If Indian, Allottee or Tribe Name

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

Allison Unit

8. Well Name and No.

Allison Unit HZFC 123H

9. API Well No.

30-045-35611

10. Field and Pool or Exploratory Area

Basin Fruitland Coal

11. Country or Parish, State

San Juan

New Mexico

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Revised C-102 &
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	Drilling Plan

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof.

If the proposal is to deepen directionally or recompleate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleation in a new interval, a Form 3160-4 must be filed once Testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Hilcorp Energy Company intends to add a pilot hole and a second lateral to the subject well. The pilot hole will be drilled to target depth of 3897' (MD), then fully cased and cemented with 7" casing. A whipstock will be run, and a window will be cut into the 7" casing above the Blue Mesa formation to allow for the first lateral to be drilled. Window depth is 3524' MD / 3199' TVD. The 4-1/2" liner will then be run outside the window and left with top at 3500' MD. An open hole sidetrack will be conducted at 3400', and lateral 2 drilled to target depth. The whipstock will then be recovered. The 4-1/2" liner will be run outside the window and not tied back into the pilot hole to allow production tubing to be run to near the bottom of the pilot hole. This allows produced water to be evacuated from the production casing.

The revised C-102 and drilling plans are attached.

OIL CONS. DIV. DIST. 3
FEB 22 2018

ADHERE TO PREVIOUS NMOCD
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

Priscilla Shorty

Title **Operations/Regulatory Technician - Sr.**

Signature

Priscilla Shorty

Date

2/16/18

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

[Signature]

Title

PE

Date

2/22/18

Office

FTO

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

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

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-8161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-8720

DISTRICT III
1000 Rio Bravos Rd., Aztec, N.M. 87410
Phone: (505) 334-8178 Fax: (505) 334-8170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 478-3460 Fax: (505) 478-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, NM 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-35611	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL#1
⁴ Property Code 313977	⁵ Property Name ALLISON UNIT HZFC	⁶ Well Number 123H
⁷ GRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6629'

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
I	9	32-N	7-W	10	1591	SOUTH	776	EAST	SAN JUAN

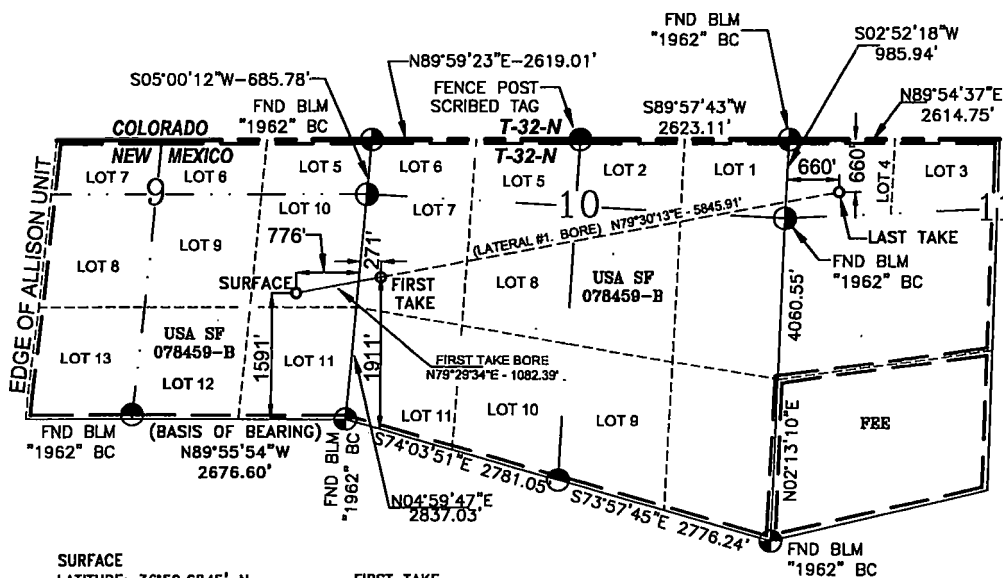
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	11	32-N	7-W	4	660	NORTH	660	WEST	SAN JUAN

¹² Dedicated Acres FC = 972.64 ACRES	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

16



SURFACE
LATITUDE: 36°59.6845' N
LONGITUDE: 107°33.9043' W
NAD27

LATITUDE: 36.994746° N
LONGITUDE: 107.565681° W
NAD83

FIRST TAKE
1911' FSL 271' FWL SEC. 10
LATITUDE: 36°59.7171' N
LONGITUDE: 107°33.6857' W
NAD27

LATITUDE: 36.995289° N
LONGITUDE: 107.562038° W
NAD83

LAST TAKE
660' FNL 660' FWL SEC. 11
LATITUDE: 36°59.8927' N
LONGITUDE: 107°32.5053' W
NAD27

LATITUDE: 36.998216° N
LONGITUDE: 107.542363° W
NAD83

BASIS OF BEARING:

BETWEEN FOUND MONUMENTS AT THE SOUTHEAST CORNER AND THE SOUTH
QUARTER CORNER OF SECTION 9, TOWNSHIP 32 NORTH, RANGE 7 WEST,
N.M.P.M. SAN JUAN COUNTY, NEW MEXICO.

LINE BEARS: N 89°55'54\" W A DISTANCE OF 2676.60 FEET AS MEASURED BY
G.P.S. LOCAL GRID NAD83.



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 released 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
a working interest, or to a voluntary pooling agreement
or a compulsory pooling order heretofore entered by the
division.

Priscilla Shorty 2/15/18
Signature Date

Priscilla Shorty
Printed Name
pshorty@hilcorp.com
E-mail Address

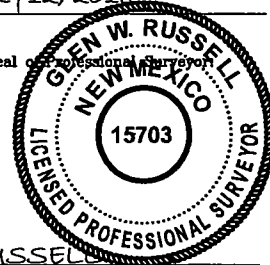
18 SURVEYOR CERTIFICATION

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

FEBRUARY 12, 2018

Date of Survey

Signature and Seal of Professional Surveyor



GLEN W. RUSSELL

Certificate Number

15703

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

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Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-35611	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL#2
⁴ Property Code 313977	⁵ Property Name ALLISON UNIT HZFC	⁶ Well Number 123H
⁷ GRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6629'

¹⁰ Surface Location

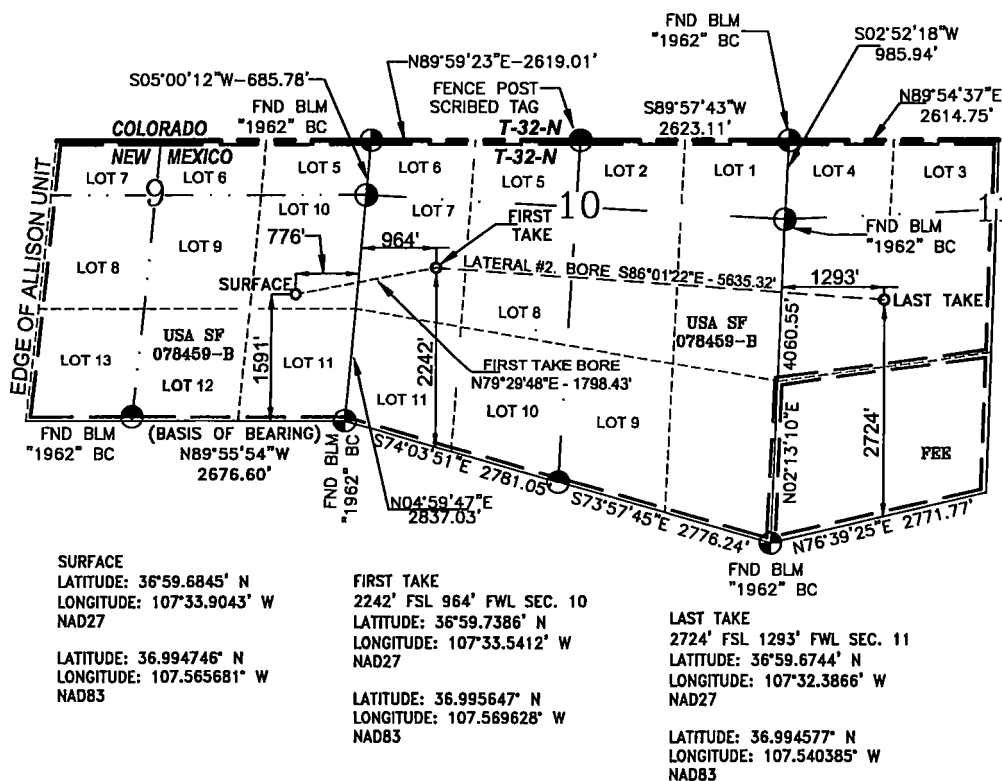
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	9	32-N	7-W	10	1591	SOUTH	776	EAST	SAN JUAN

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
L	11	32-N	7-W		2724	SOUTH	1293	WEST	SAN JUAN
¹² Dedicated Acres FC = 972.64 ACRES			¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.		

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

18



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 a working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Priscilla Shorty 2/15/18
Signature Date
Priscilla Shorty
Printed Name
pshorty@hilcorp.com
E-mail Address

18 SURVEYOR CERTIFICATION

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

FEBRUARY 13, 2018

Date of Survey

Signature and Seal of Professional Surveyor



GLEN W. RUSSELL
Certificate Number

15703

Allison Unit HZFC #123H

Hilcorp Energy Company proposes to drill and complete the referenced dual horizontal well targeting a coal seam with in the Fruitland formation. The original procedure in the APD was modified to include a pilot hole, which will be fully cased and cemented, and a second lateral, which will also have a predrilled liner installed.

1. Location

Allison Unit HZFC #123H

SHL: 1591' FSL, 776' FEL – T32N, R07W, Sec 9 (San Juan County)

BHL (Lat1): 660' FNL, 660' FWL – T 32N, R07W, Sec 11 (San Juan County)

BHL (ST / Lat2): 2724' FSL, 1293' FWL – T 32N, R07W, Sec 11 (San Juan County)

GL: 6,629'

2. Geological Markers

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

Formation	Depth (TVD)	Remarks
Nacimiento	874'	
Ojo Alamo	2,147'	
Kirtland	2,278'	
Fruitland	2,864'	Gas
Blue Mesa	3,146'	Gas

*See attached directional Plan for anticipated formation tops in measured depth.

3. Pressure Control Equipment

See attached BOPE and choke manifold schematic for a diagram of pressure control equipment.

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

4. Casing & Cement Program

a. The proposed casing program is outlined below:

Proposed Casing Program				
Casing	Hole Size	Casing Size	Weight/Grade	Set Depth TVD/MD
Surface	12-1/4"	9-5/8"	32.3# H-40	500' MD/TVD
Intermediate	8-3/4"	7"	23# J-55/L-80	3897' MD / 3353' TVD
Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	9627' MD / 3217' TVD
Production Liner (Lat 2) (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	10139' MD / 3217' TVD

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

A whipstock will be run, and window will be cut in the 7" casing above the Blue Mesa formation to allow for the first lateral to be drilled in the Blue Mesa. Window depth is 3524' MD / 3199' TVD.

The 4-1/2" liner will then be run outside the window, and left with top at 3500' MD:

An open hole sidetrack will be conducted at 3400' MD, and lat 2 drilled to target depth.

The whipstock will then be recovered. The 4-1/2" liner will be run outside the window, and not tied back into the pilot hole to allow production tubing to be run to near the bottom of the pilot hole. This allows produced water to be evacuated from the production casing.

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

The 7" casing string will be set inside the setback boundary line.

b. The proposed cement program is outlined below:

Cement Program				
Interval	Depth (MD)	Volume	Slurry	Planned Cement Top
Surface	500	253 ft ³	Lead Cmt: Type III Cmt 0.25 pps celloflake	Surface
Intermediate	3,897'	761 ft ³	Lead Cmt: 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 Tail Cmt: Type III 1% CaCl, 0.25 pps celloflake, 0.2% FL-52 1.38 ft ³ /sk -- 6.64 gal/sk 14.6 ppg	Surface
Production	9,627' / 10,139'	N/A	N/A - Open hole with pre-perforated liner.	N/A

Slurry additives may be adjusted as needed to accommodate required pump and compressive test times.

For the intermediate hole section a 2-stage cement job may be performed if hole conditions indicate during operations. Stage tool will be placed appropriately as conditions indicate.

- c. The proposed centralizer program is shown below:

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

To allow adequate time for cement to achieve a minimum of 500 psi compressive strength, a minimum of 8 hours wait on cement time for each hole section will be observed. The wellhead will not be installed, casing will not be tested, and the prior casing shoe will not be drilled out until adequate wait on cement time is achieved.

5. Drilling Fluids

- a. The proposed drilling fluid program is outlined below:

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

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

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

- b. If brine is utilized, any cuttings drilled with brine will be hauled off to an approved disposal site.

6. Abnormal Pressures and Hazards

- No over-pressured intervals expected.
- Estimated Reservoir Pressure = 1,500 psi
- Maximum Anticipated Surface Pressure = 1,300 psi
- No hydrogen sulfide gas is expected based off nearby well production.

7. Testing, Logging, Coring

Testing, Logging, Coring Procedure		
Evaluation Method	Start Depth	End depth
Mud Logs	KOP	TD
MWD Directional Surveys	KOP	TD
LWD GR	7" window	TD
Triple Combo	9-5/8" shoe	8-3/4" TD
Temp Survey	If needed on intermediate casing	

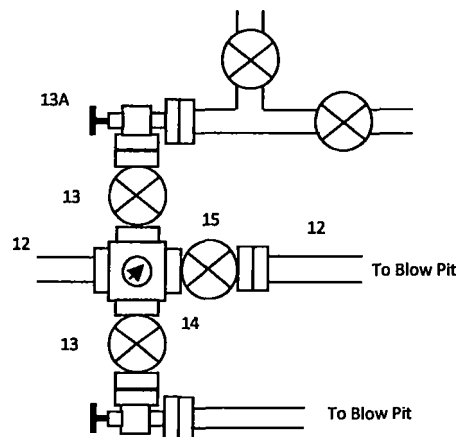
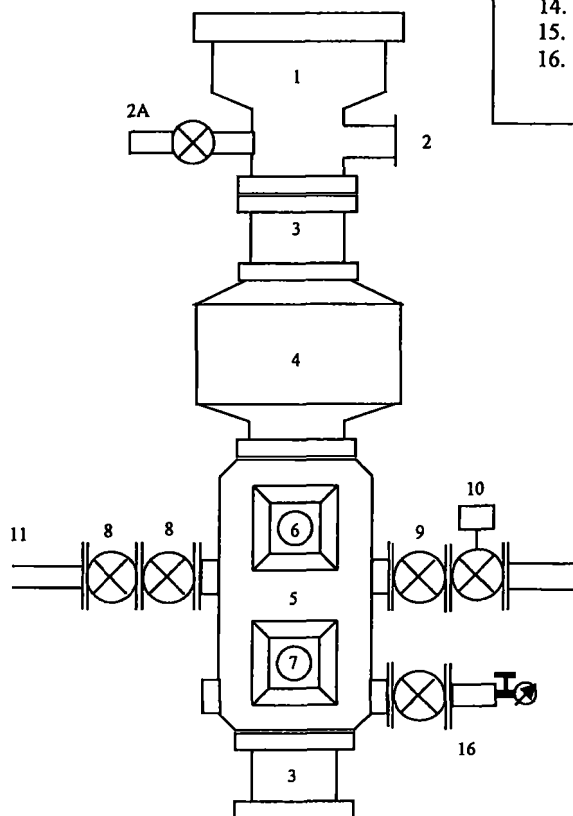
8. Directional Plan

The planned wellbore directional plan and plot are attached

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

BOPE & Choke Manifold Schematic

1. Rotating Head
2. Flow line
- 2A. Fill up line and valve
3. Spacer Spools (as needed)
4. 11" 3M Annular Preventer
5. 11" 3M Double Ram Preventer
6. Blind Rams
7. Pipe Rams
8. 3M Gate Valves (2")
9. 3M Gate Valve (3")
10. 3M HCR Valve (3")
11. Kill Line Connection
12. Choke Line (3" Hardline or Co-Flex)
13. 3M Valve (2")
- 13A. 3M Adjustable Choke (2")
- 13B. 3M Adjustable or Fixed Choke (2")
14. 3M Studded Cross & Manifold gauge
15. 3M Panic Line Valve (3")
16. Secondary outlet with valve, bull plug, needle valve, and pressure gauge





HILCORP ENERGY COMPANY
ALLISON UNIT #123H (PILOT)
SAN JUAN BASIN NM
6629' GL + 15' KB



WELL DETAILS: Allison Unit #123H

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.00	0.00	2181465.680	6629.00	578341.970	36° 59' 41.070 N	107° 33' 54.258 W

SECTION DETAILS

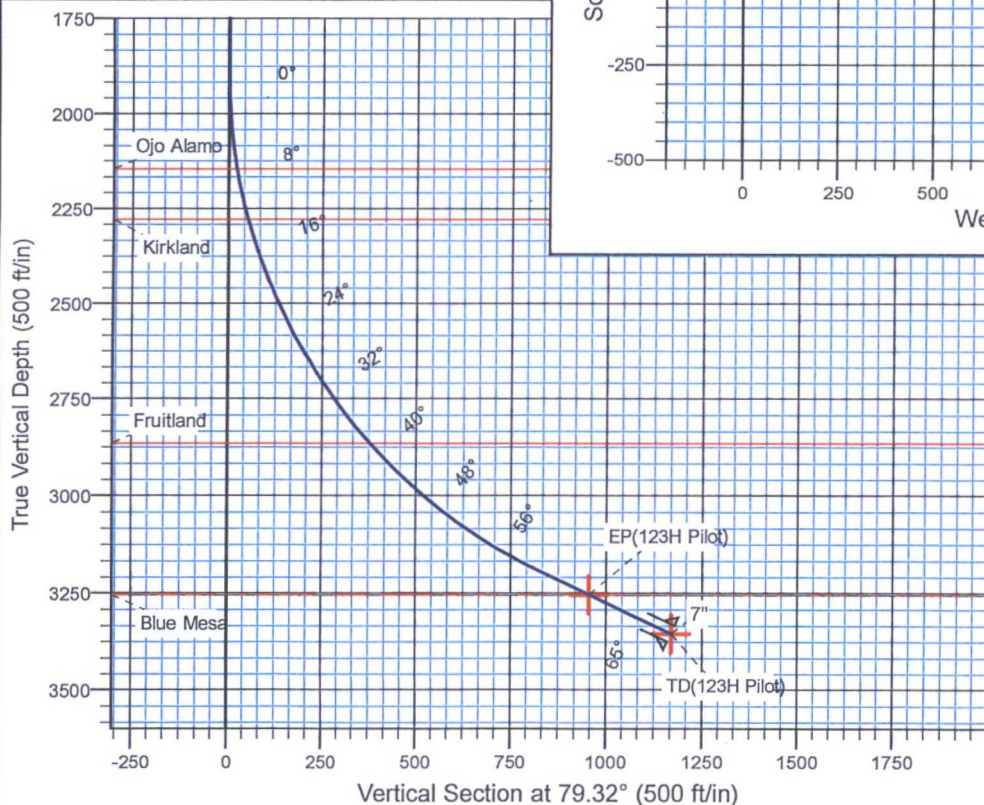
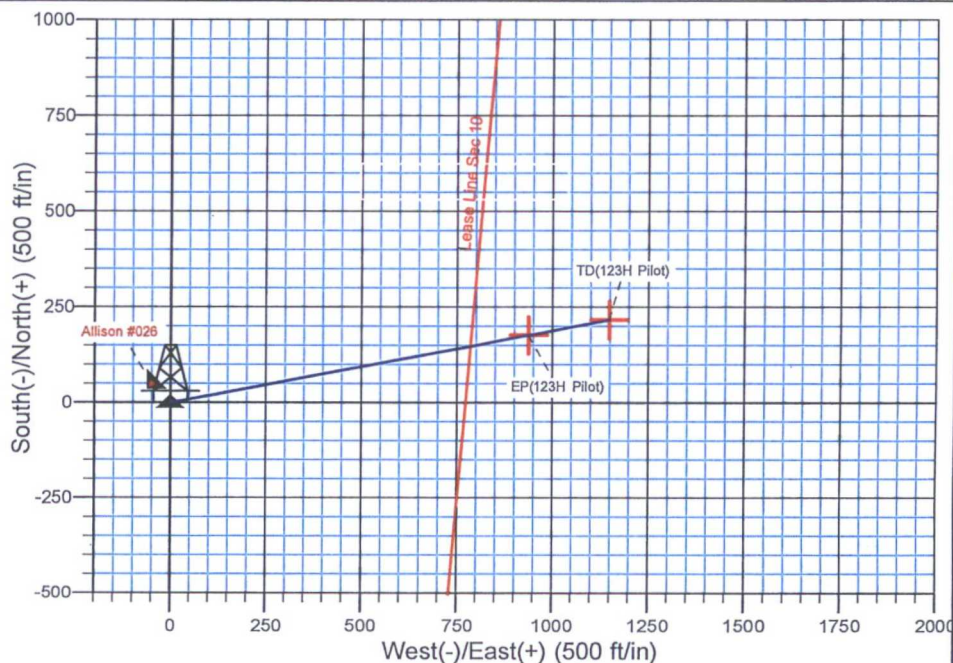
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1895.20	0.00	0.00	1895.20	0.00	0.00	0.00	0.00	0.00	
3	3520.20	65.00	79.32	3193.39	153.29	812.71	4.00	79.32	827.04	
4	3661.25	65.00	79.32	3253.00	176.99	938.33	0.00	0.00	954.88	EP(123H Pilot)
5	3897.87	65.00	79.32	3353.00	216.74	1149.07	0.00	0.00	1169.33	TD(123H Pilot)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
EP(123H Pilot)	3253.00	176.99	938.33	2181642.670	579280.300	36° 59' 42.794 N	107° 33' 42.685 W	Point
TD(123H Pilot)	3353.00	216.74	1149.07	2181682.420	579491.038	36° 59' 43.181 N	107° 33' 40.086 W	Point

CASING DETAILS

TVD	MD	Name
500	500	9 5/8"
3353	3898	7"



PROJECT DETAILS: San Juan County, NM

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

Allison Unit #123H Pilot p1

Created By: Frank Scardino Date: 1/25/2018
 Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Pilot

Plan: Design #1

Standard Planning Report

25 January, 2018





Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Design #1		

Project	San Juan County, NM		
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		Allison Unit #123H			
Site Position:		Northing:	2,181,465.680 usft	Latitude:	36° 59' 41.070 N
From:	Map	Easting:	578,341.970 usft	Longitude:	107° 33' 54.258 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.16

Well	Allison Unit #123H					
Well Position	+N/-S	0.00 ft	Northing:	2,181,465.680 usft	Latitude:	36° 59' 41.070 N
	+E/-W	0.00 ft	Easting:	578,341.970 usft	Longitude:	107° 33' 54.258 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	6,629.00 ft

Wellbore	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/25/2018	9.15	63.58	50,136

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	79.32

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,895.20	0.00	0.00	1,895.20	0.00	0.00	0.00	0.00	0.00	0.00	
3,520.20	65.00	79.32	3,193.39	153.29	812.71	4.00	4.00	0.00	79.32	
3,661.25	65.00	79.32	3,253.00	176.99	938.33	0.00	0.00	0.00	0.00	EP(123H Pilot)
3,897.87	65.00	79.32	3,353.00	216.74	1,149.07	0.00	0.00	0.00	0.00	TD(123H Pilot)



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Design #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,895.20	0.00	0.00	1,895.20	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.19	79.32	1,900.00	0.00	0.01	0.01	4.00	4.00	0.00
2,000.00	4.19	79.32	1,999.91	0.71	3.77	3.83	4.00	4.00	0.00
2,100.00	8.19	79.32	2,099.30	2.71	14.36	14.62	4.00	4.00	0.00
2,148.32	10.12	79.32	2,147.00	4.13	21.92	22.31	4.00	4.00	0.00
Ojo Alamo									
2,200.00	12.19	79.32	2,197.70	5.99	31.75	32.31	4.00	4.00	0.00
2,282.71	15.50	79.32	2,278.00	9.66	51.20	52.10	4.00	4.00	0.00
Kirkland									
2,300.00	16.19	79.32	2,294.63	10.53	55.84	56.82	4.00	4.00	0.00
2,400.00	20.19	79.32	2,389.62	16.32	86.51	88.03	4.00	4.00	0.00
2,500.00	24.19	79.32	2,482.19	23.32	123.62	125.80	4.00	4.00	0.00
2,600.00	28.19	79.32	2,571.90	31.50	166.98	169.93	4.00	4.00	0.00
2,700.00	32.19	79.32	2,658.32	40.82	216.39	220.21	4.00	4.00	0.00
2,800.00	36.19	79.32	2,741.02	51.23	271.60	276.39	4.00	4.00	0.00
2,900.00	40.19	79.32	2,819.60	62.69	332.35	338.21	4.00	4.00	0.00
2,959.18	42.56	79.32	2,864.00	69.94	370.79	377.32	4.00	4.00	0.00
Fruitland									
3,000.00	44.19	79.32	2,893.67	75.13	398.33	405.36	4.00	4.00	0.00
3,100.00	48.19	79.32	2,962.88	88.51	469.24	477.51	4.00	4.00	0.00
3,200.00	52.19	79.32	3,026.89	102.74	544.71	554.31	4.00	4.00	0.00
3,300.00	56.19	79.32	3,085.39	117.77	624.39	635.40	4.00	4.00	0.00
3,400.00	60.19	79.32	3,138.08	133.52	707.88	720.36	4.00	4.00	0.00
3,500.00	64.19	79.32	3,184.72	149.91	794.78	808.79	4.00	4.00	0.00
3,520.20	65.00	79.32	3,193.39	153.29	812.71	827.04	4.00	4.00	0.00
3,600.00	65.00	79.32	3,227.11	166.70	883.78	899.36	0.00	0.00	0.00
3,661.25	65.00	79.32	3,253.00	176.99	938.33	954.88	0.00	0.00	0.00
Blue Mesa - EP(123H Pilot)									
3,700.00	65.00	79.32	3,269.38	183.50	972.84	990.00	0.00	0.00	0.00
3,800.00	65.00	79.32	3,311.64	200.30	1,061.90	1,080.63	0.00	0.00	0.00
3,897.87	65.00	79.32	3,353.00	216.74	1,149.07	1,169.33	0.00	0.00	0.00
7" - TD(123H Pilot)									

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									
EP(123H Pilot)	0.00	0.00	3,253.00	176.99	938.33	2,181,642.670	579,280.300	36° 59' 42.794 N	107° 33' 42.685 W
- plan hits target center									
- Point									
TD(123H Pilot)	0.00	0.00	3,353.00	216.74	1,149.07	2,181,682.420	579,491.038	36° 59' 43.181 N	107° 33' 40.086 W
- plan hits target center									
- Point									



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Design #1		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)		Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"		9.625	12.250
3,897.87	3,353.00	7"		7.000	7.500

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,148.32	2,147.00	Ojo Alamo		0.00		
2,282.71	2,278.00	Kirkland		0.00		
2,959.18	2,864.00	Fruitland		0.00		
3,661.25	3,253.00	Blue Mesa		0.00		



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Pilot

Plan: Design #1

Standard Planning Report - Geographic

25 January, 2018





Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Design #1		

Project	San Juan County, NM		
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	Allison Unit #123H		
Site Position:		Northing:	2,181,465.680 usft
From:	Map	Easting:	578,341.970 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 59' 41.070 N
		Longitude:	107° 33' 54.258 W
		Grid Convergence:	0.16 °

Well	Allison Unit #123H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	36° 59' 41.070 N
		Longitude:	107° 33' 54.258 W
		Ground Level:	6,629.00 ft

Wellbore	Pilot		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	1/25/2018	9.15
			Dip Angle
			(°)
			63.58
			Field Strength
			(nT)
			50,136

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			79.32

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,895.20	0.00	0.00	1,895.20	0.00	0.00	0.00	0.00	0.00	0.00	
3,520.20	65.00	79.32	3,193.39	153.29	812.71	4.00	4.00	0.00	79.32	
3,661.25	65.00	79.32	3,253.00	176.99	938.33	0.00	0.00	0.00	0.00	EP(123H Pilot)
3,897.87	65.00	79.32	3,353.00	216.74	1,149.07	0.00	0.00	0.00	0.00	TD(123H Pilot)



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #123H
Well: Allison Unit #123H
Wellbore: Pilot
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,895.20	0.00	0.00	1,895.20	0.00	0.00	2,181,465.680	578,341.970	36° 59' 41.070 N	107° 33' 54.258 W
1,900.00	0.19	79.32	1,900.00	0.00	0.01	2,181,465.682	578,341.977	36° 59' 41.070 N	107° 33' 54.258 W
2,000.00	4.19	79.32	1,999.91	0.71	3.77	2,181,466.391	578,345.735	36° 59' 41.077 N	107° 33' 54.212 W
2,100.00	8.19	79.32	2,099.30	2.71	14.36	2,181,468.390	578,356.333	36° 59' 41.096 N	107° 33' 54.081 W
2,148.32	10.12	79.32	2,147.00	4.13	21.92	2,181,469.815	578,363.889	36° 59' 41.110 N	107° 33' 53.988 W
Ojo Alamo									
2,200.00	12.19	79.32	2,197.70	5.99	31.75	2,181,471.669	578,373.717	36° 59' 41.128 N	107° 33' 53.866 W
2,282.71	15.50	79.32	2,278.00	9.66	51.20	2,181,475.337	578,393.166	36° 59' 41.164 N	107° 33' 53.627 W
Kirkland									
2,300.00	16.19	79.32	2,294.63	10.53	55.84	2,181,476.212	578,397.805	36° 59' 41.173 N	107° 33' 53.569 W
2,400.00	20.19	79.32	2,389.62	16.32	86.51	2,181,481.998	578,428.478	36° 59' 41.229 N	107° 33' 53.191 W
2,500.00	24.19	79.32	2,482.19	23.32	123.62	2,181,488.997	578,465.587	36° 59' 41.297 N	107° 33' 52.733 W
2,600.00	28.19	79.32	2,571.90	31.50	166.98	2,181,497.177	578,508.952	36° 59' 41.377 N	107° 33' 52.198 W
2,700.00	32.19	79.32	2,658.32	40.82	216.39	2,181,506.497	578,558.360	36° 59' 41.468 N	107° 33' 51.589 W
2,800.00	36.19	79.32	2,741.02	51.23	271.60	2,181,516.911	578,613.572	36° 59' 41.569 N	107° 33' 50.908 W
2,900.00	40.19	79.32	2,819.60	62.69	332.35	2,181,528.369	578,674.318	36° 59' 41.681 N	107° 33' 50.159 W
2,959.18	42.56	79.32	2,864.00	69.94	370.79	2,181,535.619	578,712.754	36° 59' 41.751 N	107° 33' 49.685 W
Fruitland									
3,000.00	44.19	79.32	2,893.67	75.13	398.33	2,181,540.815	578,740.303	36° 59' 41.802 N	107° 33' 49.345 W
3,100.00	48.19	79.32	2,962.88	88.51	469.24	2,181,554.189	578,811.204	36° 59' 41.932 N	107° 33' 48.471 W
3,200.00	52.19	79.32	3,026.89	102.74	544.71	2,181,568.424	578,886.677	36° 59' 42.071 N	107° 33' 47.540 W
3,300.00	56.19	79.32	3,085.39	117.77	624.39	2,181,583.453	578,966.354	36° 59' 42.217 N	107° 33' 46.557 W
3,400.00	60.19	79.32	3,138.08	133.52	707.88	2,181,599.202	579,049.847	36° 59' 42.370 N	107° 33' 45.527 W
3,500.00	64.19	79.32	3,184.72	149.91	794.78	2,181,615.593	579,136.748	36° 59' 42.530 N	107° 33' 44.455 W
3,520.20	65.00	79.32	3,193.39	153.29	812.71	2,181,618.975	579,154.676	36° 59' 42.563 N	107° 33' 44.234 W
3,600.00	65.00	79.32	3,227.11	166.70	883.78	2,181,632.381	579,225.749	36° 59' 42.694 N	107° 33' 43.358 W
3,661.25	65.00	79.32	3,253.00	176.99	938.33	2,181,642.670	579,280.300	36° 59' 42.794 N	107° 33' 42.685 W
Blue Mesa - EP(123H Pilot)									
3,700.00	65.00	79.32	3,269.38	183.50	972.84	2,181,649.179	579,314.809	36° 59' 42.857 N	107° 33' 42.259 W
3,800.00	65.00	79.32	3,311.64	200.30	1,061.90	2,181,665.978	579,403.869	36° 59' 43.021 N	107° 33' 41.161 W
3,897.87	65.00	79.32	3,353.00	216.74	1,149.07	2,181,682.420	579,491.035	36° 59' 43.181 N	107° 33' 40.086 W
7" - TD(123H Pilot)									

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									
EP(123H Pilot)	0.00	0.00	3,253.00	176.99	938.33	2,181,642.670	579,280.300	36° 59' 42.794 N	107° 33' 42.685 W
- plan hits target center									
- Point									
TD(123H Pilot)	0.00	0.00	3,353.00	216.74	1,149.07	2,181,682.420	579,491.038	36° 59' 43.181 N	107° 33' 40.086 W
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"	9.625	12.250
3,897.87	3,353.00	7"	7.000	7.500



Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Design #1		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,148.32	2,147.00	Ojo Alamo		0.00		
2,282.71	2,278.00	Kirkland		0.00		
2,959.18	2,864.00	Fruitland		0.00		
3,661.25	3,253.00	Blue Mesa		0.00		



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Pilot

Design #1

Anticollision Report

25 January, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference	Design #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 center-center distance of 1,307.29 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/25/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,897.87	Design #1 (Pilot)	MWD	MWD - Standard	

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						
Allison Unit #123H Offsets						
Allison Unit #007 - Allison #007 - Allison #007						Out of range
Allison Unit #026 - Allison #026 - Allison #026	1,609.33	1,609.35	63.94	52.33	5.509	CC
Allison Unit #026 - Allison #026 - Allison #026	1,800.00	1,799.69	64.55	51.53	4.958	ES
Allison Unit #026 - Allison #026 - Allison #026	1,900.00	1,899.52	65.20	51.53	4.772	SF
Allison Unit #026M - Allison #026M - Allison #026M	3,897.87	3,343.19	1,126.53	1,097.26	38.484	CC, ES, SF
Allison Unit #034 - Allison #034 - Allison #034						Out of range
Allison Unit #055 - Allison #055 - Allison #055						Out of range
Allison Unit #055A - Allison #055A - Allison #055A						Out of range
Allison Unit #055M - Allison #055M - Allison #055M						Out of range
Allison Unit #067 - Allison #067 - Allison #067						Out of range
Allison Unit #103 - Allison #103 - Allison #103						Out of range
Allison Unit #103S - Allison #103S - Allison #103S						Out of range
Allison Unit #123S - Allison #123S LL - Allison #123S LL	3,888.77	5,436.69	974.24	822.57	6.423	CC
Allison Unit #123S - Allison #123S LL - Allison #123S LL	3,897.87	5,442.31	974.25	822.11	6.403	ES, SF
Allison Unit #123S - Allison #123S MB - Allison #123S M	3,158.32	4,460.00	1,162.15	1,082.64	14.616	CC, ES
Allison Unit #123S - Allison #123S MB - Allison #123S M	3,300.00	4,460.00	1,173.85	1,092.19	14.375	SF
Allison Unit #123S - Allison #123S UL - Allison #123S UL	3,897.87	5,490.10	975.98	843.53	7.369	CC, ES, SF
Allison Unit #124 - Allison #124 - Allison #124						Out of range

Offset Design Allison Unit #123H Offsets - Allison Unit #026 - Allison #026 - Allison #026												Offset Site Error:	0.00 ft
Survey Program: 100-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
0.00	0.00	0.00	0.00	0.00	0.00	-42.72	50.23	-46.38	68.37				
100.00	100.00	100.09	100.08	0.18	0.18	-42.82	50.10	-46.43	68.31	67.95	0.36	189.587	
200.00	200.00	200.13	200.13	0.60	0.48	-42.93	49.90	-46.41	68.15	67.07	1.08	63.333	
292.93	292.93	292.93	292.93	1.00	0.73	-42.89	49.87	-46.32	68.06	66.33	1.73	39.439	
300.00	300.00	300.00	300.00	1.03	0.75	-42.88	49.87	-46.31	68.06	66.28	1.78	38.340	
400.00	400.00	400.01	400.01	1.45	1.06	-42.81	49.93	-46.25	68.06	65.55	2.51	27.124	
500.00	500.00	500.02	500.02	1.87	1.42	-42.91	49.83	-46.32	68.04	64.75	3.29	20.697	
600.00	600.00	600.21	600.21	2.30	1.79	-43.25	49.44	-46.50	67.87	63.79	4.08	16.624	
700.00	700.00	700.38	700.38	2.72	2.11	-43.57	48.85	-46.48	67.43	62.61	4.82	13.999	
800.00	800.00	800.41	800.41	3.14	2.43	-43.94	48.13	-46.38	66.85	61.29	5.56	12.025	

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



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #026 - Allison #026 - Allison #026													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													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		
900.00	900.00	900.47	900.46	3.56	2.76	-44.30	47.37	-46.23	66.19	59.88	6.31	10.488		
1,000.00	1,000.00	1,000.43	1,000.42	3.99	3.11	-44.67	46.60	-46.06	65.52	58.45	7.08	9.258		
1,100.00	1,100.00	1,100.25	1,100.23	4.41	3.49	-45.13	45.88	-46.09	65.03	57.14	7.89	8.241		
1,200.00	1,200.00	1,200.35	1,200.34	4.83	3.85	-45.43	45.33	-46.01	64.59	55.92	8.67	7.448		
1,300.00	1,300.00	1,300.08	1,300.06	5.26	4.21	-45.60	44.97	-45.93	64.28	54.83	9.45	6.800		
1,400.00	1,400.00	1,400.07	1,400.05	5.68	4.59	-45.77	44.78	-46.00	64.19	53.93	10.26	6.255		
1,500.00	1,500.00	1,500.14	1,500.13	6.10	4.83	-45.78	44.68	-45.91	64.06	53.13	10.93	5.860		
1,600.00	1,600.00	1,600.00	1,599.98	6.53	5.02	-45.62	44.72	-45.70	63.94	52.40	11.54	5.542		
1,609.33	1,609.33	1,609.35	1,609.33	6.57	5.04	-45.61	44.73	-45.69	63.94	52.33	11.61	5.509 CC		
1,700.00	1,700.00	1,699.78	1,699.76	6.95	5.32	-45.40	45.02	-45.64	64.11	51.85	12.26	5.229		
1,800.00	1,800.00	1,799.69	1,799.67	7.37	5.65	-45.13	45.54	-45.75	64.55	51.53	13.02	4.958 ES		
1,900.00	1,900.00	1,899.52	1,899.50	7.79	5.88	-124.51	45.94	-46.25	65.20	51.53	13.66	4.772 SF		
2,000.00	1,999.91	1,999.30	1,999.28	7.82	6.05	-127.33	46.30	-47.07	68.29	54.43	13.86	4.927		
2,100.00	2,099.30	2,098.38	2,098.34	7.88	6.24	-133.72	46.79	-48.06	76.42	62.31	14.12	5.413		
2,200.00	2,197.70	2,196.67	2,196.62	7.99	6.44	-141.68	47.11	-49.27	90.86	76.45	14.41	6.304		
2,300.00	2,294.63	2,293.41	2,293.37	8.18	6.64	-149.25	47.08	-50.49	112.44	97.69	14.75	7.624		
2,400.00	2,389.62	2,388.56	2,388.50	8.48	6.88	-155.52	46.66	-51.55	141.36	126.21	15.15	9.331		
2,500.00	2,482.19	2,481.10	2,481.04	8.94	7.15	-160.35	45.89	-52.35	177.41	161.80	15.61	11.362		
2,600.00	2,571.90	2,571.38	2,571.31	9.60	7.45	-163.94	45.09	-52.87	220.27	204.15	16.12	13.664		
2,700.00	2,658.32	2,657.81	2,657.74	10.51	7.75	-166.51	44.49	-53.04	269.46	252.82	16.64	16.189		
2,800.00	2,741.02	2,740.50	2,740.43	11.69	8.04	-168.37	44.09	-53.24	324.92	307.75	17.18	18.918		
2,900.00	2,819.60	2,819.57	2,819.50	13.17	8.31	-169.73	43.81	-53.30	386.11	368.40	17.71	21.804		
3,000.00	2,893.67	2,893.84	2,893.77	14.95	8.57	-170.67	43.86	-53.31	452.72	434.49	18.23	24.831		
3,100.00	2,962.88	2,964.35	2,964.28	17.02	8.81	-171.31	44.18	-53.24	524.35	505.61	18.74	27.973		
3,200.00	3,026.89	3,029.88	3,029.80	19.37	9.03	-171.73	44.58	-53.02	600.56	581.32	19.24	31.216		
3,300.00	3,085.39	3,089.94	3,089.87	21.98	9.24	-171.94	45.03	-52.72	681.02	661.31	19.71	34.555		
3,400.00	3,138.08	3,143.46	3,143.38	24.84	9.42	-171.94	45.50	-52.40	765.38	745.24	20.14	37.996		
3,500.00	3,184.72	3,190.77	3,190.69	27.92	9.58	-171.71	45.95	-52.13	853.28	832.74	20.54	41.540		
3,600.00	3,227.11	3,233.63	3,233.55	31.16	9.73	-172.22	46.37	-51.88	943.39	922.48	20.90	45.132		
3,700.00	3,269.38	3,276.25	3,276.16	34.45	9.88	-172.85	46.73	-51.64	1,033.59	1,012.34	21.25	48.640		
3,800.00	3,311.64	3,319.17	3,319.08	37.76	10.02	-173.39	47.05	-51.40	1,123.82	1,102.22	21.60	52.023		
3,897.87	3,353.00	3,361.66	3,361.57	41.03	10.16	-173.85	47.34	-51.15	1,212.14	1,190.19	21.95	55.212		

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



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #026M - Allison #026M - Allison #026M												Offset Site Error:	0.00 ft
Survey Program: 100-MWD												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	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
3,700.00	3,269.38	3,257.66	3,257.58	34.45	9.81	-39.53	835.43	2,089.54	1,293.13	1,267.60	25.53	50.655	
3,800.00	3,311.64	3,301.48	3,301.39	37.76	9.96	-41.76	835.77	2,089.78	1,208.50	1,181.23	27.27	44.316	
3,897.87	3,353.00	3,343.19	3,343.10	41.03	10.10	-44.09	836.07	2,090.02	1,126.53	1,097.26	29.27	38.484 CC, ES, SF	



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Pilot
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #123S - Allison #123S LL - Allison #123S LL													Offset Site Error:	0.00 ft
Survey Program: 800-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation		
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	Toolface (")	+N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor		
2,500.00	2,482.19	4,448.02	3,284.36	8.94	71.98	-104.00	1,045.14	12.65	1,303.81	1,238.49	65.32	19.960		
2,600.00	2,571.90	4,483.56	3,284.19	9.60	73.38	-104.97	1,049.44	47.92	1,248.10	1,178.77	69.33	18.002		
2,700.00	2,658.32	4,536.59	3,283.47	10.51	75.48	-104.85	1,055.83	100.56	1,197.70	1,123.48	74.22	16.137		
2,800.00	2,741.02	4,582.77	3,283.42	11.69	77.31	-104.80	1,061.41	146.40	1,153.40	1,074.23	79.17	14.569		
2,900.00	2,819.60	4,628.88	3,283.87	13.17	79.14	-104.53	1,067.17	192.15	1,115.43	1,031.08	84.35	13.224		
3,000.00	2,893.67	4,703.28	3,284.21	14.95	82.09	-102.97	1,077.14	265.88	1,083.55	992.78	90.78	11.936		
3,100.00	2,962.88	4,778.94	3,283.49	17.02	85.10	-101.24	1,087.16	340.86	1,056.68	959.24	97.44	10.844		
3,200.00	3,026.89	4,850.37	3,283.46	19.37	87.95	-99.63	1,096.52	411.68	1,034.95	930.93	104.02	9.949		
3,300.00	3,085.39	4,911.00	3,283.24	21.98	90.36	-98.32	1,105.05	471.70	1,018.41	908.23	110.18	9.243		
3,400.00	3,138.08	5,013.52	3,284.34	24.84	94.44	-95.86	1,118.68	573.30	1,005.01	887.02	117.99	8.518		
3,500.00	3,184.72	5,106.07	3,283.14	27.92	98.14	-93.76	1,130.52	665.08	994.03	868.64	125.40	7.927		
3,600.00	3,227.11	5,184.98	3,281.53	31.16	101.29	-91.82	1,141.59	743.20	986.47	854.28	132.19	7.462		
3,700.00	3,269.38	5,302.28	3,280.55	34.45	105.98	-88.88	1,157.30	859.42	980.45	840.11	140.34	6.986		
3,800.00	3,311.64	5,369.09	3,280.29	37.76	108.66	-87.21	1,166.01	925.66	975.78	829.47	146.31	6.669		
3,888.77	3,349.15	5,436.69	3,280.09	40.73	111.36	-85.51	1,175.60	992.58	974.24	822.57	151.67	6.423 CC		
3,897.87	3,353.00	5,442.31	3,280.15	41.03	111.58	-85.38	1,176.47	998.12	974.25	822.11	152.15	6.403 ES, SF		



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Pilot
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #123S - Allison #123S MB - Allison #123S MB													Offset Site Error:	0.00 ft
Survey Program: 800-MWD													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		
2,600.00	2,571.90	4,170.00	3,282.60	9.60	60.88	-117.48	1,024.53	-266.95	1,295.95	1,237.70	58.26	22.246		
2,700.00	2,658.32	4,242.81	3,313.02	10.51	63.40	-117.22	1,031.78	-201.20	1,258.98	1,196.71	62.26	20.220		
2,800.00	2,741.02	4,322.42	3,346.12	11.69	66.15	-116.74	1,040.54	-129.33	1,227.04	1,160.30	66.74	18.386		
2,900.00	2,819.60	4,410.05	3,382.06	13.17	69.20	-116.09	1,050.71	-50.06	1,199.50	1,127.76	71.73	16.722		
3,000.00	2,893.67	4,460.00	3,402.22	14.95	70.95	-116.05	1,056.77	-4.76	1,176.74	1,100.88	75.86	15.512		
3,100.00	2,962.88	4,460.00	3,402.22	17.02	70.95	-116.51	1,056.77	-4.76	1,164.14	1,085.86	78.28	14.872		
3,158.32	3,000.86	4,460.00	3,402.22	18.39	70.95	-116.58	1,056.77	-4.76	1,162.15	1,082.64	79.51	14.616 CC, ES		
3,200.00	3,026.89	4,460.00	3,402.22	19.37	70.95	-116.54	1,056.77	-4.76	1,163.17	1,082.93	80.24	14.496		
3,300.00	3,085.39	4,460.00	3,402.22	21.98	70.95	-116.16	1,056.77	-4.76	1,173.85	1,092.19	81.66	14.375 SF		
3,400.00	3,138.08	4,460.00	3,402.22	24.84	70.95	-115.34	1,056.77	-4.76	1,195.83	1,113.32	82.51	14.493		
3,500.00	3,184.72	4,460.00	3,402.22	27.92	70.95	-114.09	1,056.77	-4.76	1,228.40	1,145.58	82.82	14.831		
3,600.00	3,227.11	4,460.00	3,402.22	31.16	70.95	-113.78	1,056.77	-4.76	1,269.80	1,187.12	82.69	15.357		



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Pilot	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #123S - Allison #123S UL - Allison #123S UL												Offset Site Error:	0.00 ft
Survey Program: 800-MWD, 3913-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Distance							
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	Warning
2,500.00	2,482.19	4,358.01	3,177.41	8.94	59.54	-104.24	1,069.90	-56.70	1,269.32	1,211.02	58.30	21.770	
2,600.00	2,571.90	4,412.64	3,178.90	9.60	60.85	-103.92	1,078.24	-2.72	1,221.85	1,159.97	61.88	19.746	
2,700.00	2,658.32	4,551.13	3,177.72	10.51	64.42	-99.67	1,096.01	134.57	1,178.94	1,111.33	67.62	17.436	
2,800.00	2,741.02	4,628.13	3,174.05	11.69	66.53	-97.98	1,102.64	211.19	1,138.70	1,066.29	72.40	15.727	
2,900.00	2,819.60	4,689.00	3,169.03	13.17	68.25	-96.76	1,107.52	271.66	1,103.38	1,026.25	77.14	14.304	
3,000.00	2,893.67	4,751.72	3,163.73	14.95	70.07	-95.30	1,113.03	333.91	1,074.39	992.28	82.11	13.085	
3,100.00	2,962.88	4,825.87	3,157.99	17.02	72.28	-93.27	1,118.47	407.64	1,050.08	962.60	87.48	12.004	
3,200.00	3,026.89	4,890.04	3,153.41	19.37	74.23	-91.59	1,123.20	471.47	1,030.88	938.20	92.67	11.124	
3,300.00	3,085.39	4,970.32	3,149.15	21.98	76.74	-89.35	1,129.98	551.34	1,016.84	918.54	98.29	10.345	
3,400.00	3,138.08	5,044.87	3,148.95	24.84	79.13	-87.55	1,135.29	625.69	1,005.20	901.41	103.78	9.686	
3,500.00	3,184.72	5,135.92	3,150.27	27.92	82.10	-85.52	1,142.93	716.41	996.70	886.94	109.77	9.080	
3,600.00	3,227.11	5,228.80	3,152.44	31.16	85.19	-83.39	1,150.39	808.96	989.35	873.52	115.83	8.542	
3,700.00	3,269.38	5,334.70	3,154.61	34.45	88.79	-80.84	1,157.42	914.60	982.39	860.29	122.10	8.046	
3,800.00	3,311.64	5,405.42	3,156.10	37.76	91.22	-79.12	1,162.67	985.11	977.88	850.65	127.24	7.686	
3,897.87	3,353.00	5,490.10	3,158.40	41.03	94.17	-77.10	1,169.80	1,069.45	975.98	843.53	132.45	7.369 CC, ES, SF	

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



Anticollision Report



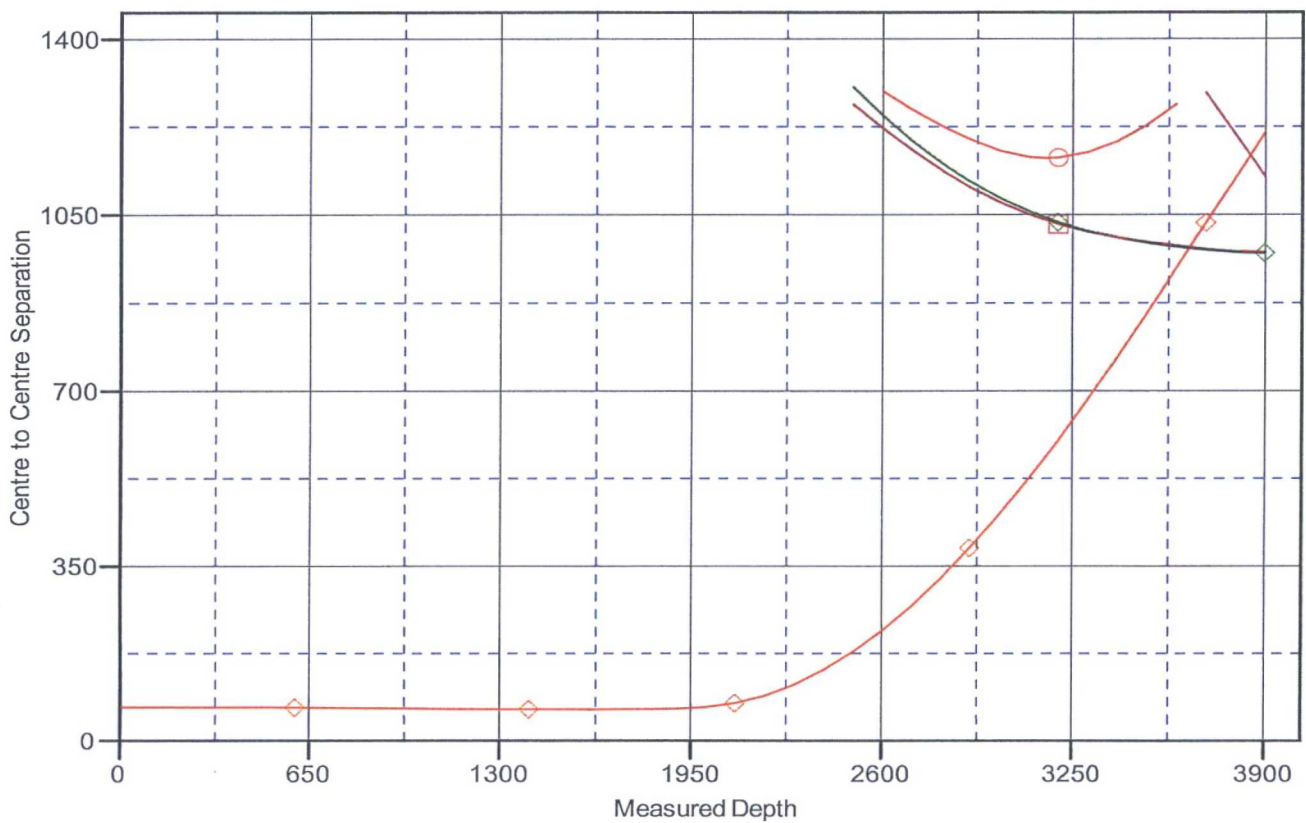
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Pilot
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to rig @ 6644.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #123H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.16°

Ladder Plot



LEGEND

Jnt #026, Allison #026, Allison #026 V0
Jnt #026M, Allison #026M, Allison #026M V0

— Allison Unit #123S, Allison #123S LL, Allison #123S LL V0
— Allison Unit #123S, Allison #123S MB, Allison #123S MB V0

— Allison Unit #123S, Allison #123S UL, Allison #123S UL V0



Anticollision Report



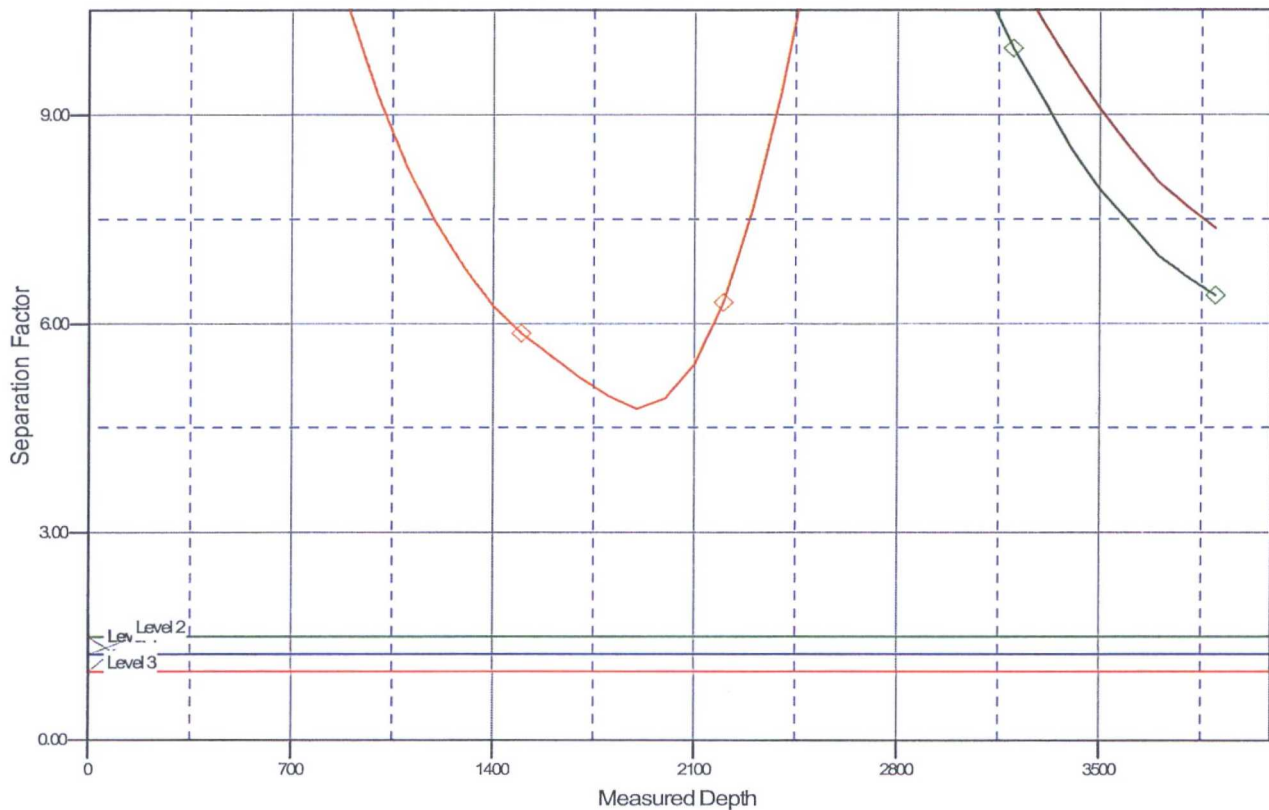
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Pilot
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to rig @ 6644.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #123H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.16°

Separation Factor Plot



LEGEND

Jnt #026, Allison #026, Allison #026 V0
Jnt #026M, Allison #026M, Allison #026M V0

— Allison Unit #123S, Allison #123S LL, Allison #123S LL V0
— Allison Unit #123S, Allison #123S MB, Allison #123S MB V0

— Allison Unit #123S, Allison #123S UL, Allison #123S UL V0



HILCORP ENERGY COMPANY
ALLISON UNIT #123H (HORZ)
SAN JUAN BASIN NM
6629' GL + 15' KB



WELL DETAILS: Allison Unit #123H

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.00	0.00	2181465.680	6629.00	578341.970	36° 59' 41.070 N	107° 33' 54.258 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	3534.20	65.00	79.32	3199.31	155.65	825.18	0.00	0.00	839.73	
2	3784.26	90.00	79.32	3253.00	200.54	1063.18	10.00	0.00	1081.93	
3	4834.26	90.00	79.32	3253.00	395.13	2095.00	0.00	0.00	2131.93	
4	8427.78	90.69	79.32	3231.42	1060.98	5626.20	0.02	0.25	5725.37	
5	9627.90	90.69	79.32	3217.00	1283.31	6805.45	0.00	0.00	6925.39	TD(123H Horz)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD(123H Horz)	3217.00	1283.31	6805.45	2182748.990	585147.410	36° 59' 53.562 N	107° 32' 30.318 W	Point
EP(123H Pilot)	3253.00	176.99	938.33	2181642.670	579280.300	36° 59' 42.794 N	107° 33' 42.685 W	Point
Take Point(123H Horz)	3253.00	200.54	1063.18	2181666.220	579405.148	36° 59' 43.023 N	107° 33' 41.145 W	Point

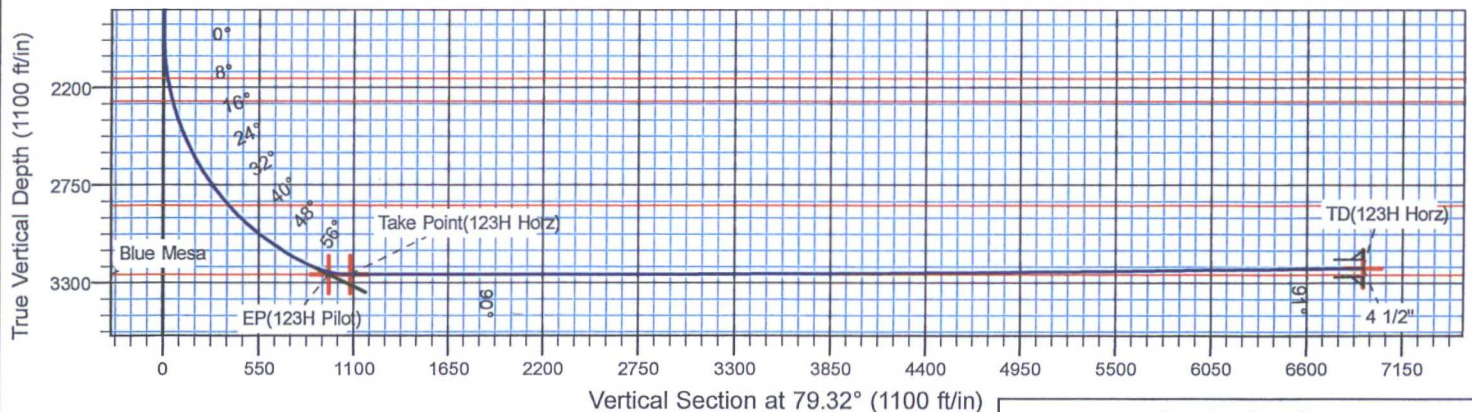
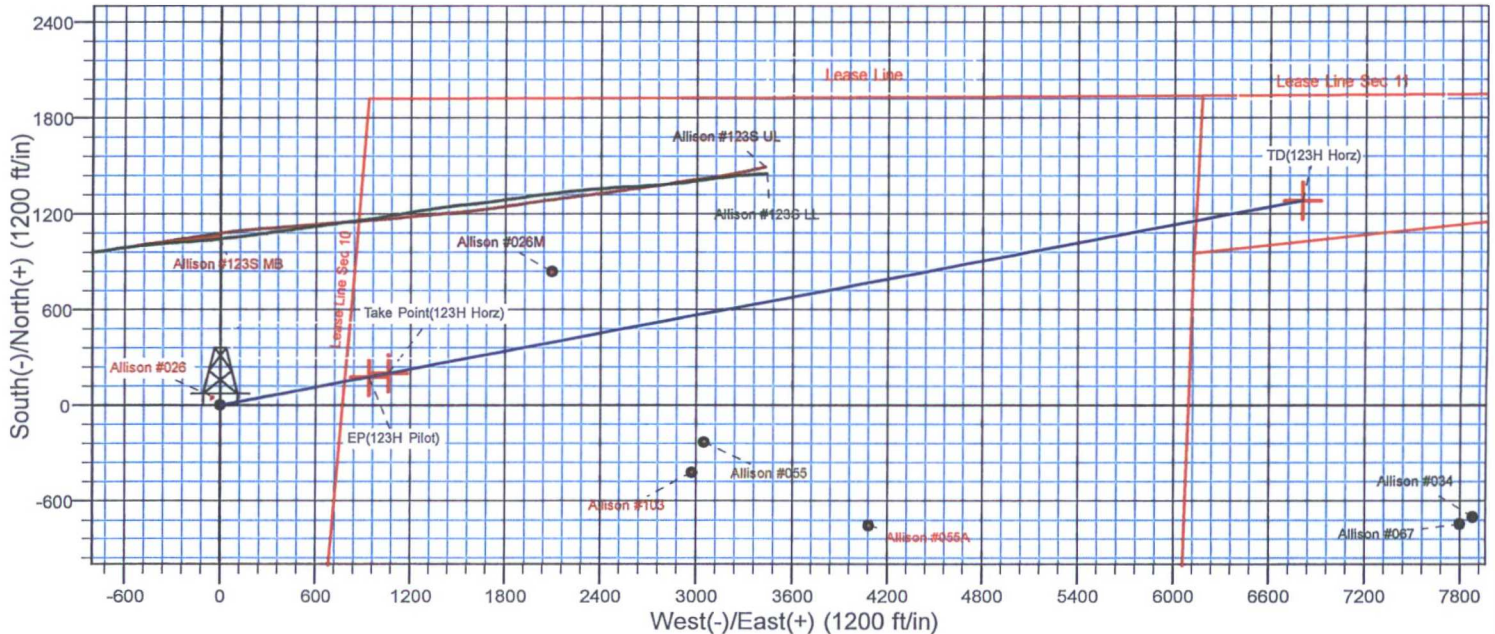
PROJECT DETAILS: San Juan County, NM

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

TVD	MD	Name
3217	9628	4 1/2"



Allison Unit #123H Horz p1

Created By: Frank Scardino Date: 1/25/2018
 Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Horz

Plan: Design #1

Standard Planning Report

25 January, 2018





Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz		
Design:	Design #1		

Project	San Juan County, NM		
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	Allison Unit #123H		
Site Position:		Northing:	2,181,465.680 usft
From:	Map	Easting:	578,341.970 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 59' 41.070 N
		Longitude:	107° 33' 54.258 W
		Grid Convergence:	0.16 °

Well	Allison Unit #123H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	36° 59' 41.070 N
		Longitude:	107° 33' 54.258 W
		Ground Level:	6,629.00 ft

Wellbore	Horz		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	1/25/2018	9.15
			Dip Angle
			(°)
			63.58
			Field Strength
			(nT)
			50,136

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			3,534.20
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			79.32

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
3,534.20	65.00	79.32	3,199.31	155.65	825.18	0.00	0.00	0.00	0.00	
3,784.26	90.00	79.32	3,253.00	200.54	1,063.18	10.00	10.00	0.00	0.00	
4,834.26	90.00	79.32	3,253.00	395.13	2,095.00	0.00	0.00	0.00	0.00	
8,427.78	90.69	79.32	3,231.42	1,060.98	5,626.20	0.02	0.02	0.00	0.25	
9,627.90	90.69	79.32	3,217.00	1,283.31	6,805.45	0.00	0.00	0.00	0.00	TD(123H Horz)



Planning Report



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #123H
Well: Allison Unit #123H
Wellbore: Horz
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,534.20	65.00	79.32	3,199.31	155.65	825.18	839.73	0.00	0.00	0.00
3,550.00	66.58	79.32	3,205.78	158.32	839.34	854.14	10.00	10.00	0.00
3,600.00	71.58	79.32	3,223.63	166.97	885.22	900.83	10.00	10.00	0.00
3,650.00	76.58	79.32	3,237.35	175.88	932.45	948.89	10.00	10.00	0.00
3,658.84	77.46	79.32	3,239.33	177.48	940.92	957.51	10.00	10.00	0.00
EP(123H Pilot)									
3,700.00	81.58	79.32	3,246.82	184.98	980.68	997.97	10.00	10.00	0.00
3,750.00	86.57	79.32	3,251.98	194.19	1,029.54	1,047.69	10.00	10.00	0.00
3,784.26	90.00	79.32	3,253.00	200.54	1,063.18	1,081.93	10.00	10.00	0.00
Blue Mesa - Take Point(123H Horz)									
3,800.00	90.00	79.32	3,253.00	203.45	1,078.65	1,097.67	0.00	0.00	0.00
3,900.00	90.00	79.32	3,253.00	221.99	1,176.92	1,197.67	0.00	0.00	0.00
4,000.00	90.00	79.32	3,253.00	240.52	1,275.19	1,297.67	0.00	0.00	0.00
4,100.00	90.00	79.32	3,253.00	259.05	1,373.45	1,397.67	0.00	0.00	0.00
4,200.00	90.00	79.32	3,253.00	277.58	1,471.72	1,497.67	0.00	0.00	0.00
4,300.00	90.00	79.32	3,253.00	296.11	1,569.99	1,597.67	0.00	0.00	0.00
4,400.00	90.00	79.32	3,253.00	314.65	1,668.26	1,697.67	0.00	0.00	0.00
4,500.00	90.00	79.32	3,253.00	333.18	1,766.52	1,797.67	0.00	0.00	0.00
4,600.00	90.00	79.32	3,253.00	351.71	1,864.79	1,897.67	0.00	0.00	0.00
4,700.00	90.00	79.32	3,253.00	370.24	1,963.06	1,997.67	0.00	0.00	0.00
4,800.00	90.00	79.32	3,253.00	388.78	2,061.33	2,097.67	0.00	0.00	0.00
4,834.26	90.00	79.32	3,253.00	395.13	2,095.00	2,131.93	0.00	0.00	0.00
4,900.00	90.01	79.32	3,252.99	407.31	2,159.60	2,197.67	0.02	0.02	0.00
5,000.00	90.03	79.32	3,252.95	425.84	2,257.86	2,297.67	0.02	0.02	0.00
5,100.00	90.05	79.32	3,252.88	444.37	2,356.13	2,397.67	0.02	0.02	0.00
5,200.00	90.07	79.32	3,252.78	462.91	2,454.40	2,497.67	0.02	0.02	0.00
5,300.00	90.09	79.32	3,252.64	481.44	2,552.67	2,597.67	0.02	0.02	0.00
5,400.00	90.11	79.32	3,252.47	499.97	2,650.93	2,697.67	0.02	0.02	0.00
5,500.00	90.13	79.32	3,252.26	518.50	2,749.20	2,797.67	0.02	0.02	0.00
5,600.00	90.15	79.32	3,252.02	537.03	2,847.47	2,897.67	0.02	0.02	0.00
5,700.00	90.17	79.32	3,251.75	555.56	2,945.74	2,997.67	0.02	0.02	0.00
5,800.00	90.18	79.32	3,251.44	574.09	3,044.00	3,097.67	0.02	0.02	0.00
5,900.00	90.20	79.32	3,251.10	592.62	3,142.27	3,197.67	0.02	0.02	0.00
6,000.00	90.22	79.32	3,250.73	611.15	3,240.54	3,297.67	0.02	0.02	0.00
6,100.00	90.24	79.32	3,250.32	629.69	3,338.81	3,397.67	0.02	0.02	0.00
6,200.00	90.26	79.32	3,249.88	648.22	3,437.07	3,497.67	0.02	0.02	0.00
6,300.00	90.28	79.32	3,249.41	666.75	3,535.34	3,597.66	0.02	0.02	0.00
6,400.00	90.30	79.32	3,248.90	685.28	3,633.61	3,697.66	0.02	0.02	0.00
6,500.00	90.32	79.32	3,248.36	703.81	3,731.87	3,797.66	0.02	0.02	0.00
6,600.00	90.34	79.32	3,247.79	722.33	3,830.14	3,897.66	0.02	0.02	0.00
6,700.00	90.36	79.32	3,247.18	740.86	3,928.41	3,997.66	0.02	0.02	0.00
6,800.00	90.38	79.32	3,246.54	759.39	4,026.67	4,097.66	0.02	0.02	0.00
6,900.00	90.40	79.32	3,245.87	777.92	4,124.94	4,197.65	0.02	0.02	0.00
7,000.00	90.41	79.32	3,245.16	796.45	4,223.21	4,297.65	0.02	0.02	0.00
7,100.00	90.43	79.32	3,244.42	814.98	4,321.47	4,397.65	0.02	0.02	0.00
7,200.00	90.45	79.32	3,243.65	833.51	4,419.74	4,497.65	0.02	0.02	0.00
7,300.00	90.47	79.32	3,242.84	852.04	4,518.00	4,597.64	0.02	0.02	0.00
7,400.00	90.49	79.32	3,242.00	870.56	4,616.27	4,697.64	0.02	0.02	0.00
7,500.00	90.51	79.32	3,241.12	889.09	4,714.53	4,797.63	0.02	0.02	0.00
7,600.00	90.53	79.32	3,240.21	907.62	4,812.80	4,897.63	0.02	0.02	0.00
7,700.00	90.55	79.32	3,239.27	926.15	4,911.06	4,997.63	0.02	0.02	0.00
7,800.00	90.57	79.32	3,238.30	944.68	5,009.32	5,097.62	0.02	0.02	0.00
7,900.00	90.59	79.32	3,237.29	963.20	5,107.59	5,197.62	0.02	0.02	0.00
8,000.00	90.61	79.32	3,236.25	981.73	5,205.85	5,297.61	0.02	0.02	0.00



Planning Report



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #123H
Well: Allison Unit #123H
Wellbore: Horz
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,100.00	90.63	79.32	3,235.17	1,000.26	5,304.11	5,397.61	0.02	0.02	0.00
8,200.00	90.64	79.32	3,234.07	1,018.78	5,402.38	5,497.60	0.02	0.02	0.00
8,300.00	90.66	79.32	3,232.92	1,037.31	5,500.64	5,597.59	0.02	0.02	0.00
8,400.00	90.68	79.32	3,231.75	1,055.83	5,598.90	5,697.59	0.02	0.02	0.00
8,427.78	90.69	79.32	3,231.42	1,060.98	5,626.20	5,725.37	0.02	0.02	0.00
8,500.00	90.69	79.32	3,230.55	1,074.36	5,697.16	5,797.58	0.00	0.00	0.00
8,600.00	90.69	79.32	3,229.35	1,092.89	5,795.42	5,897.57	0.00	0.00	0.00
8,700.00	90.69	79.32	3,228.15	1,111.41	5,893.69	5,997.56	0.00	0.00	0.00
8,800.00	90.69	79.32	3,226.95	1,129.94	5,991.95	6,097.56	0.00	0.00	0.00
8,900.00	90.69	79.32	3,225.74	1,148.46	6,090.21	6,197.55	0.00	0.00	0.00
9,000.00	90.69	79.32	3,224.54	1,166.99	6,188.47	6,297.54	0.00	0.00	0.00
9,100.00	90.69	79.32	3,223.34	1,185.52	6,286.73	6,397.54	0.00	0.00	0.00
9,200.00	90.69	79.32	3,222.14	1,204.04	6,384.99	6,497.53	0.00	0.00	0.00
9,300.00	90.69	79.32	3,220.94	1,222.57	6,483.26	6,597.52	0.00	0.00	0.00
9,400.00	90.69	79.32	3,219.74	1,241.09	6,581.52	6,697.51	0.00	0.00	0.00
9,500.00	90.69	79.32	3,218.54	1,259.62	6,679.78	6,797.51	0.00	0.00	0.00
9,600.00	90.69	79.32	3,217.34	1,278.14	6,778.04	6,897.50	0.00	0.00	0.00
9,627.90	90.69	79.32	3,217.00	1,283.31	6,805.45	6,925.39	0.00	0.00	0.00

TD(123H Horz)

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD(123H Horz) - plan hits target center - Point	0.00	0.00	3,217.00	1,283.31	6,805.45	2,182,748.990	585,147.410	36° 59' 53.562 N	107° 32' 30.318 W
EP(123H Pilot) - plan misses target center by 13.92ft at 3658.84ft MD (3239.33 TVD, 177.48 N, 940.92 E) - Point	0.00	0.00	3,253.00	176.99	938.33	2,181,642.670	579,280.300	36° 59' 42.794 N	107° 33' 42.685 W
Take Point(123H Horz) - plan hits target center - Point	0.00	0.00	3,253.00	200.54	1,063.18	2,181,666.220	579,405.148	36° 59' 43.023 N	107° 33' 41.145 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"	9.625	12.250
9,627.90	3,217.00	4 1/2"	4.500	6.000



Planning Report



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #123H
Well: Allison Unit #123H
Wellbore: Horz
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,148.32	2,147.00	Ojo Alamo				
2,282.71	2,278.00	Kirkland				
2,959.18	2,864.00	Fruitland				
3,784.26	3,253.00	Blue Mesa		0.00		



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Horz

Plan: Design #1

Standard Planning Report - Geographic

25 January, 2018





Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz		
Design:	Design #1		

Project	San Juan County, NM		
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	Allison Unit #123H			
Site Position:		Northing:	2,181,465.680 usft	Latitude: 36° 59' 41.070 N
From:	Map	Easting:	578,341.970 usft	Longitude: 107° 33' 54.258 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.16 °

Well	Allison Unit #123H			
Well Position	+N/-S	0.00 ft	Northing:	2,181,465.680 usft
	+E/-W	0.00 ft	Easting:	578,341.970 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level: 6,629.00 ft

Wellbore	Horz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/25/2018	9.15	63.58	50,136

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	3,534.20
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	79.32

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
3,534.20	65.00	79.32	3,199.31	155.65	825.18	0.00	0.00	0.00	0.00	
3,784.26	90.00	79.32	3,253.00	200.54	1,063.18	10.00	10.00	0.00	0.00	
4,834.26	90.00	79.32	3,253.00	395.13	2,095.00	0.00	0.00	0.00	0.00	
8,427.78	90.69	79.32	3,231.42	1,060.98	5,626.20	0.02	0.02	0.00	0.25	
9,627.90	90.69	79.32	3,217.00	1,283.31	6,805.45	0.00	0.00	0.00	0.00	TD(123H Horz)



Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz		
Design:	Design #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,534.20	65.00	79.32	3,199.31	155.65	825.18	2,181,621.327	579,167.147	36° 59' 42.586 N	107° 33' 44.080 W
3,550.00	66.58	79.32	3,205.78	158.32	839.34	2,181,623.998	579,181.307	36° 59' 42.612 N	107° 33' 43.906 W
3,600.00	71.58	79.32	3,223.63	166.97	885.22	2,181,632.652	579,227.187	36° 59' 42.696 N	107° 33' 43.340 W
3,650.00	76.58	79.32	3,237.35	175.88	932.45	2,181,641.560	579,274.421	36° 59' 42.783 N	107° 33' 42.757 W
3,658.84	77.46	79.32	3,239.33	177.48	940.92	2,181,643.158	579,282.890	36° 59' 42.799 N	107° 33' 42.653 W
EP(123H Pilot)									
3,700.00	81.58	79.32	3,246.82	184.98	980.68	2,181,650.656	579,322.649	36° 59' 42.872 N	107° 33' 42.163 W
3,750.00	86.57	79.32	3,251.98	194.19	1,029.54	2,181,659.871	579,371.505	36° 59' 42.961 N	107° 33' 41.560 W
3,784.26	90.00	79.32	3,253.00	200.54	1,063.18	2,181,666.216	579,405.149	36° 59' 43.023 N	107° 33' 41.145 W
Blue Mesa - Take Point(123H Horz)									
3,800.00	90.00	79.32	3,253.00	203.45	1,078.65	2,181,669.133	579,420.618	36° 59' 43.052 N	107° 33' 40.954 W
3,900.00	90.00	79.32	3,253.00	221.99	1,176.92	2,181,687.665	579,518.886	36° 59' 43.232 N	107° 33' 39.742 W
4,000.00	90.00	79.32	3,253.00	240.52	1,275.19	2,181,706.198	579,617.154	36° 59' 43.413 N	107° 33' 38.530 W
4,100.00	90.00	79.32	3,253.00	259.05	1,373.45	2,181,724.730	579,715.421	36° 59' 43.593 N	107° 33' 37.318 W
4,200.00	90.00	79.32	3,253.00	277.58	1,471.72	2,181,743.262	579,813.689	36° 59' 43.773 N	107° 33' 36.106 W
4,300.00	90.00	79.32	3,253.00	296.11	1,569.99	2,181,761.795	579,911.956	36° 59' 43.954 N	107° 33' 34.894 W
4,400.00	90.00	79.32	3,253.00	314.65	1,668.26	2,181,780.327	580,010.224	36° 59' 44.134 N	107° 33' 33.682 W
4,500.00	90.00	79.32	3,253.00	333.18	1,766.52	2,181,798.859	580,108.491	36° 59' 44.315 N	107° 33' 32.470 W
4,600.00	90.00	79.32	3,253.00	351.71	1,864.79	2,181,817.392	580,206.759	36° 59' 44.495 N	107° 33' 31.258 W
4,700.00	90.00	79.32	3,253.00	370.24	1,963.06	2,181,835.924	580,305.026	36° 59' 44.676 N	107° 33' 30.046 W
4,800.00	90.00	79.32	3,253.00	388.78	2,061.33	2,181,854.456	580,403.294	36° 59' 44.856 N	107° 33' 28.834 W
4,834.26	90.00	79.32	3,253.00	395.13	2,095.00	2,181,860.806	580,436.961	36° 59' 44.918 N	107° 33' 28.419 W
4,900.00	90.01	79.32	3,252.99	407.31	2,159.60	2,181,872.989	580,501.562	36° 59' 45.037 N	107° 33' 27.622 W
5,000.00	90.03	79.32	3,252.95	425.84	2,257.86	2,181,891.521	580,599.829	36° 59' 45.217 N	107° 33' 26.410 W
5,100.00	90.05	79.32	3,252.88	444.37	2,356.13	2,181,910.053	580,698.097	36° 59' 45.397 N	107° 33' 25.198 W
5,200.00	90.07	79.32	3,252.78	462.91	2,454.40	2,181,928.585	580,796.364	36° 59' 45.578 N	107° 33' 23.986 W
5,300.00	90.09	79.32	3,252.64	481.44	2,552.67	2,181,947.116	580,894.632	36° 59' 45.758 N	107° 33' 22.774 W
5,400.00	90.11	79.32	3,252.47	499.97	2,650.93	2,181,965.648	580,992.899	36° 59' 45.939 N	107° 33' 21.562 W
5,500.00	90.13	79.32	3,252.26	518.50	2,749.20	2,181,984.179	581,091.167	36° 59' 46.119 N	107° 33' 20.350 W
5,600.00	90.15	79.32	3,252.02	537.03	2,847.47	2,182,002.710	581,189.434	36° 59' 46.300 N	107° 33' 19.138 W
5,700.00	90.17	79.32	3,251.75	555.56	2,945.74	2,182,021.242	581,287.702	36° 59' 46.480 N	107° 33' 17.926 W
5,800.00	90.18	79.32	3,251.44	574.09	3,044.00	2,182,039.772	581,385.969	36° 59' 46.660 N	107° 33' 16.713 W
5,900.00	90.20	79.32	3,251.10	592.62	3,142.27	2,182,058.303	581,484.236	36° 59' 46.841 N	107° 33' 15.501 W
6,000.00	90.22	79.32	3,250.73	611.15	3,240.54	2,182,076.834	581,582.504	36° 59' 47.021 N	107° 33' 14.289 W
6,100.00	90.24	79.32	3,250.32	629.69	3,338.81	2,182,095.364	581,680.771	36° 59' 47.202 N	107° 33' 13.077 W
6,200.00	90.26	79.32	3,249.88	648.22	3,437.07	2,182,113.894	581,779.038	36° 59' 47.382 N	107° 33' 11.865 W
6,300.00	90.28	79.32	3,249.41	666.75	3,535.34	2,182,132.424	581,877.304	36° 59' 47.562 N	107° 33' 10.653 W
6,400.00	90.30	79.32	3,248.90	685.28	3,633.61	2,182,150.954	581,975.571	36° 59' 47.743 N	107° 33' 9.441 W
6,500.00	90.32	79.32	3,248.36	703.81	3,731.87	2,182,169.484	582,073.838	36° 59' 47.923 N	107° 33' 8.229 W
6,600.00	90.34	79.32	3,247.79	722.33	3,830.14	2,182,188.014	582,172.104	36° 59' 48.103 N	107° 33' 7.017 W
6,700.00	90.36	79.32	3,247.18	740.86	3,928.41	2,182,206.543	582,270.370	36° 59' 48.284 N	107° 33' 5.805 W
6,800.00	90.38	79.32	3,246.54	759.39	4,026.67	2,182,225.072	582,368.636	36° 59' 48.464 N	107° 33' 4.593 W
6,900.00	90.40	79.32	3,245.87	777.92	4,124.94	2,182,243.601	582,466.902	36° 59' 48.644 N	107° 33' 3.381 W
7,000.00	90.41	79.32	3,245.16	796.45	4,223.21	2,182,262.130	582,565.168	36° 59' 48.825 N	107° 33' 2.169 W
7,100.00	90.43	79.32	3,244.42	814.98	4,321.47	2,182,280.659	582,663.433	36° 59' 49.005 N	107° 33' 0.957 W
7,200.00	90.45	79.32	3,243.65	833.51	4,419.74	2,182,299.187	582,761.699	36° 59' 49.185 N	107° 32' 59.745 W
7,300.00	90.47	79.32	3,242.84	852.04	4,518.00	2,182,317.715	582,859.964	36° 59' 49.366 N	107° 32' 58.533 W
7,400.00	90.49	79.32	3,242.00	870.56	4,616.27	2,182,336.243	582,958.228	36° 59' 49.546 N	107° 32' 57.321 W
7,500.00	90.51	79.32	3,241.12	889.09	4,714.53	2,182,354.771	583,056.493	36° 59' 49.726 N	107° 32' 56.109 W
7,600.00	90.53	79.32	3,240.21	907.62	4,812.80	2,182,373.299	583,154.757	36° 59' 49.907 N	107° 32' 54.897 W
7,700.00	90.55	79.32	3,239.27	926.15	4,911.06	2,182,391.826	583,253.021	36° 59' 50.087 N	107° 32' 53.685 W
7,800.00	90.57	79.32	3,238.30	944.68	5,009.32	2,182,410.353	583,351.285	36° 59' 50.267 N	107° 32' 52.473 W
7,900.00	90.59	79.32	3,237.29	963.20	5,107.59	2,182,428.880	583,449.548	36° 59' 50.448 N	107° 32' 51.261 W
8,000.00	90.61	79.32	3,236.25	981.73	5,205.85	2,182,447.407	583,547.811	36° 59' 50.628 N	107° 32' 50.049 W



Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz		
Design:	Design #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,100.00	90.63	79.32	3,235.17	1,000.26	5,304.11	2,182,465.934	583,646.074	36° 59' 50.808 N	107° 32' 48.837 W
8,200.00	90.64	79.32	3,234.07	1,018.78	5,402.38	2,182,484.460	583,744.336	36° 59' 50.988 N	107° 32' 47.624 W
8,300.00	90.66	79.32	3,232.92	1,037.31	5,500.64	2,182,502.986	583,842.598	36° 59' 51.169 N	107° 32' 46.412 W
8,400.00	90.68	79.32	3,231.75	1,055.83	5,598.90	2,182,521.512	583,940.860	36° 59' 51.349 N	107° 32' 45.200 W
8,427.78	90.69	79.32	3,231.42	1,060.98	5,626.20	2,182,526.660	583,968.161	36° 59' 51.399 N	107° 32' 44.864 W
8,500.00	90.69	79.32	3,230.55	1,074.36	5,697.16	2,182,540.038	584,039.122	36° 59' 51.529 N	107° 32' 43.988 W
8,600.00	90.69	79.32	3,229.35	1,092.89	5,795.42	2,182,558.564	584,137.383	36° 59' 51.709 N	107° 32' 42.776 W
8,700.00	90.69	79.32	3,228.15	1,111.41	5,893.69	2,182,577.090	584,235.645	36° 59' 51.890 N	107° 32' 41.564 W
8,800.00	90.69	79.32	3,226.95	1,129.94	5,991.95	2,182,595.616	584,333.906	36° 59' 52.070 N	107° 32' 40.352 W
8,900.00	90.69	79.32	3,225.74	1,148.46	6,090.21	2,182,614.141	584,432.167	36° 59' 52.250 N	107° 32' 39.140 W
9,000.00	90.69	79.32	3,224.54	1,166.99	6,188.47	2,182,632.667	584,530.429	36° 59' 52.430 N	107° 32' 37.928 W
9,100.00	90.69	79.32	3,223.34	1,185.52	6,286.73	2,182,651.193	584,628.690	36° 59' 52.611 N	107° 32' 36.716 W
9,200.00	90.69	79.32	3,222.14	1,204.04	6,384.99	2,182,669.719	584,726.952	36° 59' 52.791 N	107° 32' 35.504 W
9,300.00	90.69	79.32	3,220.94	1,222.57	6,483.26	2,182,688.245	584,825.213	36° 59' 52.971 N	107° 32' 34.292 W
9,400.00	90.69	79.32	3,219.74	1,241.09	6,581.52	2,182,706.770	584,923.475	36° 59' 53.151 N	107° 32' 33.080 W
9,500.00	90.69	79.32	3,218.54	1,259.62	6,679.78	2,182,725.296	585,021.736	36° 59' 53.331 N	107° 32' 31.868 W
9,600.00	90.69	79.32	3,217.34	1,278.14	6,778.04	2,182,743.822	585,119.998	36° 59' 53.512 N	107° 32' 30.656 W
9,627.90	90.69	79.32	3,217.00	1,283.31	6,805.45	2,182,748.990	585,147.410	36° 59' 53.562 N	107° 32' 30.318 W
TD(123H Horz)									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD(123H Horz)	0.00	0.00	3,217.00	1,283.31	6,805.45	2,182,748.990	585,147.410	36° 59' 53.562 N	107° 32' 30.318 W
- plan hits target center									
- Point									
EP(123H Pilot)	0.00	0.00	3,253.00	176.99	938.33	2,181,642.670	579,280.300	36° 59' 42.794 N	107° 33' 42.685 W
- plan misses target center by 13.92ft at 3658.84ft MD (3239.33 TVD, 177.48 N, 940.92 E)									
- Point									
Take Point(123H Horz)	0.00	0.00	3,253.00	200.54	1,063.18	2,181,666.220	579,405.148	36° 59' 43.023 N	107° 33' 41.145 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
500.00	500.00	9 5/8"	9.625	12.250	
9,627.90	3,217.00	4 1/2"	4.500	6.000	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,784.26	3,253.00	Blue Mesa		0.00	



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #123H
Well: Allison Unit #123H
Wellbore: Horz
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Horz

Design #1

Anticollision Report

25 January, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference	Design #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 center-center distance of 1,307.29 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/25/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,534.20	Design #1 (Pilot)	MWD	MWD - Standard	
3,534.20	9,627.84	Design #1 (Horz)	MWD	MWD - Standard	

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						
Allison Unit #123H						
Allison Unit #123H - Pilot - Design #1	3,900.00	3,881.30	102.61	99.81	36.674	CC, ES, SF
Allison Unit #123H Offsets						
Allison Unit #007 - Allison #007 - Allison #007						Out of range
Allison Unit #026 - Allison #026 - Allison #026	1,609.33	1,609.35	63.94	52.33	5.509	CC
Allison Unit #026 - Allison #026 - Allison #026	1,800.00	1,799.69	64.55	51.53	4.958	ES
Allison Unit #026 - Allison #026 - Allison #026	1,900.00	1,899.52	65.20	51.53	4.772	SF
Allison Unit #026M - Allison #026M - Allison #026M	4,910.44	3,249.83	433.64	354.32	5.467	CC, ES
Allison Unit #026M - Allison #026M - Allison #026M	5,000.00	3,250.44	442.79	361.63	5.455	SF
Allison Unit #034 - Allison #034 - Allison #034						Out of range
Allison Unit #055 - Allison #055 - Allison #055	5,656.54	3,251.87	793.38	688.80	7.586	CC
Allison Unit #055 - Allison #055 - Allison #055	5,700.00	3,251.75	794.57	688.46	7.488	ES
Allison Unit #055 - Allison #055 - Allison #055	5,800.00	3,251.44	806.25	697.76	7.432	SF
Allison Unit #055A - Allison #055A - Allison #055A						Out of range
Allison Unit #055M - Allison #055M - Allison #055M						Out of range
Allison Unit #067 - Allison #067 - Allison #067						Out of range
Allison Unit #103 - Allison #103 - Allison #103	5,547.34	3,252.15	965.66	865.27	9.619	CC
Allison Unit #103 - Allison #103 - Allison #103	5,600.00	3,252.02	967.09	864.83	9.457	ES
Allison Unit #103 - Allison #103 - Allison #103	5,700.00	3,251.75	977.65	872.60	9.306	SF
Allison Unit #103S - Allison #103S - Allison #103S						Out of range
Allison Unit #123S - Allison #123S LL - Allison #123S LL	6,348.08	7,898.00	790.69	456.07	2.363	CC, ES, SF
Allison Unit #123S - Allison #123S MB - Allison #123S M	3,158.32	4,460.00	1,162.15	1,082.64	14.616	CC, ES
Allison Unit #123S - Allison #123S MB - Allison #123S M	3,300.00	4,460.00	1,173.85	1,092.19	14.375	SF
Allison Unit #123S - Allison #123S UL - Allison #123S UL	6,140.27	7,664.78	833.25	543.29	2.874	CC
Allison Unit #123S - Allison #123S UL - Allison #123S UL	6,400.00	7,872.00	840.46	533.78	2.741	ES, SF
Allison Unit #124 - Allison #124 - Allison #124						Out of range

Offset Design		Allison Unit #123H - Allison Unit #123H - Pilot - Design #1										Offset Site Error:		0.00 ft			
Survey Program:		0-MWD												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		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
3,534.20	3,198.93	3,534.20	3,199.30	0.00	0.00	-179.99	155.65	825.18	0.41	0.41	0.00	N/A					

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



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H - Allison Unit #123H - Pilot - Design #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													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		
3,600.00	3,223.63	3,599.86	3,227.05	1.39	2.14	-180.00	166.68	883.65	3.77	2.88	0.90	4.212		
3,700.00	3,246.82	3,697.70	3,268.40	3.05	5.35	-180.00	183.11	970.79	23.82	22.22	1.59	14.947		
3,800.00	3,253.00	3,790.67	3,307.69	5.15	8.44	-180.00	198.73	1,053.59	60.35	58.07	2.27	26.551		
3,900.00	3,253.00	3,881.30	3,345.99	7.58	11.47	-180.00	213.96	1,134.30	102.61	99.81	2.80	36.674	CC, ES, SF	
4,000.00	3,253.00	3,897.87	3,353.00	10.27	12.02	-180.00	216.74	1,149.07	162.70	160.91	1.79	90.652		
4,100.00	3,253.00	3,897.87	3,353.00	13.18	12.02	-180.00	216.74	1,149.07	249.28	247.03	2.25	110.865		
4,200.00	3,253.00	3,897.87	3,353.00	16.26	12.02	-180.00	216.74	1,149.07	343.23	340.68	2.55	134.627		
4,300.00	3,253.00	3,897.87	3,353.00	19.48	12.02	-180.00	216.74	1,149.07	439.86	436.26	3.60	122.167		
4,400.00	3,253.00	3,897.87	3,353.00	22.80	12.02	-180.00	216.74	1,149.07	537.72	533.35	4.37	122.911		
4,500.00	3,253.00	3,897.87	3,353.00	26.23	12.02	-180.00	216.74	1,149.07	636.25	631.20	5.05	125.947		
4,600.00	3,253.00	3,897.87	3,353.00	29.72	12.02	-180.00	216.74	1,149.07	735.17	729.50	5.68	129.521		
4,700.00	3,253.00	3,897.87	3,353.00	33.28	12.02	-180.00	216.74	1,149.07	834.36	828.09	6.27	133.152		
4,800.00	3,253.00	3,897.87	3,353.00	36.89	12.02	-180.00	216.74	1,149.07	933.71	926.88	6.83	136.687		
4,900.00	3,252.99	3,897.87	3,353.00	40.55	12.02	-180.00	216.74	1,149.07	1,033.19	1,025.82	7.38	140.086		
5,000.00	3,252.95	3,897.87	3,353.00	44.24	12.02	-180.00	216.74	1,149.07	1,132.77	1,124.87	7.90	143.348		
5,100.00	3,252.88	3,897.87	3,353.00	47.97	12.02	-180.00	216.74	1,149.07	1,232.41	1,224.00	8.41	146.482		



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #026 - Allison #026 - Allison #026												Offset Site Error:	0.00 ft
Survey Program: 100-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Distance							
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	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-42.72	50.23	-46.38	68.37				
100.00	100.00	100.09	100.08	0.18	0.18	-42.82	50.10	-46.43	68.31	67.95	0.36	189.587	
200.00	200.00	200.13	200.13	0.60	0.48	-42.93	49.90	-46.41	68.15	67.07	1.08	63.333	
292.93	292.93	292.93	292.93	1.00	0.73	-42.89	49.87	-46.32	68.06	66.33	1.73	39.439	
300.00	300.00	300.00	300.00	1.03	0.75	-42.88	49.87	-46.31	68.06	66.28	1.78	38.340	
400.00	400.00	400.01	400.01	1.45	1.06	-42.81	49.93	-46.25	68.06	65.55	2.51	27.124	
500.00	500.00	500.02	500.02	1.87	1.42	-42.91	49.83	-46.32	68.04	64.75	3.29	20.697	
600.00	600.00	600.21	600.21	2.30	1.79	-43.25	49.44	-46.50	67.87	63.79	4.08	16.624	
700.00	700.00	700.38	700.38	2.72	2.11	-43.57	48.85	-46.48	67.43	62.61	4.82	13.999	
800.00	800.00	800.41	800.41	3.14	2.43	-43.94	48.13	-46.38	66.85	61.29	5.56	12.025	
900.00	900.00	900.47	900.46	3.56	2.76	-44.30	47.37	-46.23	66.19	59.88	6.31	10.488	
1,000.00	1,000.00	1,000.43	1,000.42	3.99	3.11	-44.67	46.60	-46.06	65.52	58.45	7.08	9.258	
1,100.00	1,100.00	1,100.25	1,100.23	4.41	3.49	-45.13	45.88	-46.09	65.03	57.14	7.89	8.241	
1,200.00	1,200.00	1,200.35	1,200.34	4.83	3.85	-45.43	45.33	-46.01	64.59	55.92	8.67	7.448	
1,300.00	1,300.00	1,300.08	1,300.06	5.26	4.21	-45.60	44.97	-45.93	64.28	54.83	9.45	6.800	
1,400.00	1,400.00	1,400.07	1,400.05	5.68	4.59	-45.77	44.78	-46.00	64.19	53.93	10.26	6.255	
1,500.00	1,500.00	1,500.14	1,500.13	6.10	4.83	-45.78	44.68	-45.91	64.06	53.13	10.93	5.860	
1,600.00	1,600.00	1,600.00	1,599.98	6.53	5.02	-45.62	44.72	-45.70	63.94	52.40	11.54	5.542	
1,609.33	1,609.33	1,609.35	1,609.33	6.57	5.04	-45.61	44.73	-45.69	63.94	52.33	11.61	5.509 CC	
1,700.00	1,700.00	1,699.78	1,699.76	6.95	5.32	-45.40	45.02	-45.64	64.11	51.85	12.26	5.229	
1,800.00	1,800.00	1,799.69	1,799.67	7.37	5.65	-45.13	45.54	-45.75	64.55	51.53	13.02	4.958 ES	
1,900.00	1,900.00	1,899.52	1,899.50	7.79	5.88	-124.51	45.94	-46.25	65.20	51.53	13.66	4.772 SF	
2,000.00	1,999.91	1,999.30	1,999.28	7.82	6.05	-127.33	46.30	-47.07	68.29	54.43	13.86	4.927	
2,100.00	2,099.30	2,098.38	2,098.34	7.88	6.24	-133.72	46.79	-48.06	76.42	62.31	14.12	5.413	
2,200.00	2,197.70	2,196.67	2,196.62	7.99	6.44	-141.68	47.11	-49.27	90.86	76.45	14.41	6.304	
2,300.00	2,294.63	2,293.41	2,293.37	8.18	6.64	-149.25	47.08	-50.49	112.44	97.69	14.75	7.624	
2,400.00	2,389.62	2,388.56	2,388.50	8.48	6.88	-155.52	46.66	-51.55	141.36	126.21	15.15	9.331	
2,500.00	2,482.19	2,481.10	2,481.04	8.94	7.15	-160.35	45.89	-52.35	177.41	161.80	15.61	11.362	
2,600.00	2,571.90	2,571.38	2,571.31	9.60	7.45	-163.94	45.09	-52.87	220.27	204.15	16.12	13.664	
2,700.00	2,658.32	2,657.81	2,657.74	10.51	7.75	-166.51	44.49	-53.04	269.46	252.82	16.64	16.189	
2,800.00	2,741.02	2,740.50	2,740.43	11.69	8.04	-168.37	44.09	-53.24	324.92	307.75	17.18	18.918	
2,900.00	2,819.60	2,819.57	2,819.50	13.17	8.31	-169.73	43.81	-53.30	386.11	368.40	17.71	21.804	
3,000.00	2,893.67	2,893.84	2,893.77	14.95	8.57	-170.67	43.86	-53.31	452.72	434.49	18.23	24.831	
3,100.00	2,962.88	2,964.35	2,964.28	17.02	8.81	-171.31	44.18	-53.24	524.35	505.61	18.74	27.973	
3,200.00	3,026.89	3,029.88	3,029.80	19.37	9.03	-171.73	44.58	-53.02	600.56	581.32	19.24	31.216	
3,300.00	3,085.39	3,089.94	3,089.87	21.98	9.24	-171.94	45.03	-52.72	681.02	661.31	19.71	34.555	
3,400.00	3,138.08	3,143.46	3,143.38	24.84	9.42	-171.94	45.50	-52.40	765.38	745.24	20.14	37.996	
3,500.00	3,184.72	3,190.77	3,190.69	27.92	9.58	-171.71	45.95	-52.13	853.28	832.74	20.54	41.540	
3,600.00	3,223.63	3,230.18	3,230.10	30.03	9.72	-169.73	46.34	-51.90	944.87	922.66	22.21	42.545	
3,700.00	3,246.82	3,253.91	3,253.82	31.69	9.80	-160.85	46.55	-51.76	1,041.71	1,019.41	22.29	46.724	
3,800.00	3,253.00	3,260.75	3,260.66	33.79	9.82	-97.88	46.61	-51.73	1,141.23	1,118.93	22.30	51.175	
3,900.00	3,253.00	3,261.45	3,261.36	36.21	9.83	-98.59	46.61	-51.72	1,241.12	1,218.85	22.27	55.731	

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



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #026M - Allison #026M - Allison #026M													Offset Site Error: 0.00 ft	
Survey Program: 100-MWD													Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
3,700.00	3,246.82	3,234.65	3,234.56	31.69	9.73	-66.40	835.23	2,089.41	1,285.40	1,259.80	25.60	50.214		
3,800.00	3,253.00	3,241.71	3,241.62	33.79	9.76	-88.50	835.29	2,089.45	1,192.09	1,165.44	26.65	44.731		
3,900.00	3,253.00	3,242.45	3,242.36	36.21	9.76	-88.59	835.30	2,089.45	1,099.54	1,071.50	28.04	39.217		
4,000.00	3,253.00	3,243.18	3,243.10	38.90	9.76	-88.69	835.31	2,089.46	1,008.42	978.54	29.88	33.745		
4,100.00	3,253.00	3,243.92	3,243.83	41.80	9.76	-88.79	835.31	2,089.46	919.15	886.85	32.30	28.458		
4,200.00	3,253.00	3,244.65	3,244.57	44.88	9.77	-88.89	835.32	2,089.47	832.32	796.90	35.41	23.504		
4,300.00	3,253.00	3,245.39	3,245.30	48.09	9.77	-88.98	835.32	2,089.47	748.78	709.40	39.38	19.016		
4,400.00	3,253.00	3,246.12	3,246.03	51.42	9.77	-89.08	835.33	2,089.48	669.77	625.41	44.36	15.099		
4,500.00	3,253.00	3,246.85	3,246.76	54.84	9.77	-89.18	835.34	2,089.48	597.08	546.59	50.49	11.826		
4,600.00	3,253.00	3,247.58	3,247.49	58.33	9.78	-89.27	835.34	2,089.48	533.31	475.56	57.74	9.236		
4,700.00	3,253.00	3,248.31	3,248.22	61.89	9.78	-89.37	835.35	2,089.49	482.01	416.29	65.72	7.335		
4,800.00	3,253.00	3,249.03	3,248.95	65.50	9.78	-89.46	835.36	2,089.49	447.49	374.16	73.33	6.103		
4,900.00	3,252.99	3,249.75	3,249.67	69.16	9.78	-89.56	835.36	2,089.50	433.77	354.85	78.92	5.497		
4,910.44	3,252.99	3,249.83	3,249.74	69.54	9.78	-89.57	835.36	2,089.50	433.64	354.32	79.32	5.467 CC, ES		
5,000.00	3,252.95	3,250.44	3,250.35	72.85	9.79	-89.65	835.37	2,089.50	442.79	361.63	81.16	5.455 SF		
5,100.00	3,252.88	3,251.09	3,251.00	76.57	9.79	-89.73	835.37	2,089.50	473.26	393.15	80.11	5.908		
5,200.00	3,252.78	3,251.70	3,251.62	80.33	9.79	-89.80	835.38	2,089.51	521.43	444.51	76.92	6.779		
5,300.00	3,252.64	3,252.28	3,252.20	84.11	9.79	-89.86	835.38	2,089.51	582.92	510.05	72.86	8.000		
5,400.00	3,252.47	3,252.83	3,252.75	87.91	9.80	-89.91	835.39	2,089.51	653.99	585.23	68.76	9.511		
5,500.00	3,252.26	3,253.34	3,253.26	91.72	9.80	-89.96	835.39	2,089.52	731.85	666.86	64.99	11.261		
5,600.00	3,252.02	3,253.82	3,253.73	95.56	9.80	-89.99	835.40	2,089.52	814.56	752.90	61.66	13.210		
5,700.00	3,251.75	3,254.26	3,254.18	99.40	9.80	-90.02	835.40	2,089.52	900.79	842.00	58.79	15.323		
5,800.00	3,251.44	3,254.67	3,254.58	103.26	9.80	-90.04	835.41	2,089.52	989.61	933.30	56.31	17.575		
5,900.00	3,251.10	3,255.04	3,254.96	107.14	9.80	-90.04	835.41	2,089.53	1,080.39	1,026.21	54.18	19.942		
6,000.00	3,250.73	3,255.38	3,255.30	111.02	9.80	-90.04	835.41	2,089.53	1,172.66	1,120.33	52.33	22.407		
6,100.00	3,250.32	3,255.69	3,255.60	114.91	9.81	-90.03	835.41	2,089.53	1,266.11	1,215.38	50.74	24.955		

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



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #055 - Allison #055 - Allison #055												Offset Site Error:	0.00 ft
Survey Program: 3353-MWD												Offset Well Error:	0.00 ft
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Semi Major Axis		Highside	Offset Wellbore Centre		Distance		Minimum Separation	Separation Factor	Warning
(ft)	(ft)	(ft)	(ft)	Reference	Offset	Toolface	+N/-S	+E/-W	Between Centres	Between Ellipses	(ft)		
4,700.00	3,253.00	3,253.00	3,253.00	61.89	6.85	90.00	-232.13	3,050.06	1,242.75	1,195.32	47.43	26.202	
4,800.00	3,253.00	3,253.00	3,253.00	65.50	6.85	90.00	-232.13	3,050.06	1,167.52	1,115.30	52.22	22.357	
4,900.00	3,252.99	3,252.99	3,252.99	69.16	6.85	90.01	-232.13	3,050.06	1,096.27	1,038.69	57.57	19.041	
5,000.00	3,252.95	3,252.95	3,252.95	72.85	6.85	90.03	-232.13	3,050.06	1,029.80	966.32	63.49	16.221	
5,100.00	3,252.88	3,252.88	3,252.88	76.57	6.85	90.04	-232.13	3,050.06	969.12	899.21	69.91	13.862	
5,200.00	3,252.78	3,252.78	3,252.78	80.33	6.85	90.04	-232.13	3,050.06	915.36	838.64	76.72	11.931	
5,300.00	3,252.64	3,252.64	3,252.64	84.11	6.85	90.04	-232.13	3,050.06	869.81	786.10	83.72	10.390	
5,400.00	3,252.47	3,252.47	3,252.47	87.91	6.85	90.04	-232.13	3,050.06	833.83	743.26	90.57	9.207	
5,500.00	3,252.26	3,252.26	3,252.26	91.72	6.85	90.03	-232.13	3,050.06	808.68	711.81	96.86	8.349	
5,600.00	3,252.02	3,252.02	3,252.02	95.56	6.85	90.01	-232.13	3,050.06	795.39	693.23	102.17	7.785	
5,656.54	3,251.87	3,251.87	3,251.87	97.73	6.85	90.00	-232.13	3,050.06	793.38	688.80	104.58	7.586 CC	
5,700.00	3,251.75	3,251.75	3,251.75	99.40	6.85	89.99	-232.13	3,050.06	794.57	688.46	106.11	7.488 ES	
5,800.00	3,251.44	3,251.44	3,251.44	103.26	6.85	89.97	-232.13	3,050.06	806.25	697.76	108.49	7.432 SF	
5,900.00	3,251.10	3,251.10	3,251.10	107.14	6.85	89.94	-232.13	3,050.06	829.89	720.56	109.33	7.590	
6,000.00	3,250.73	3,250.73	3,250.73	111.02	6.85	89.90	-232.13	3,050.06	864.53	755.69	108.84	7.943	
6,100.00	3,250.32	3,250.32	3,250.32	114.91	6.85	89.86	-232.13	3,050.06	908.90	801.58	107.33	8.469	
6,200.00	3,249.88	3,249.88	3,249.88	118.81	6.84	89.82	-232.13	3,050.06	961.66	856.56	105.10	9.150	
6,300.00	3,249.41	3,249.41	3,249.41	122.72	6.84	89.77	-232.13	3,050.06	1,021.51	919.05	102.46	9.970	
6,400.00	3,248.90	3,248.90	3,248.90	126.63	6.84	89.72	-232.13	3,050.06	1,087.27	987.66	99.61	10.915	
6,500.00	3,248.36	3,248.36	3,248.36	130.55	6.84	89.66	-232.13	3,050.06	1,157.95	1,061.23	96.72	11.972	
6,600.00	3,247.79	3,247.79	3,247.79	134.48	6.84	89.60	-232.13	3,050.06	1,232.70	1,138.81	93.89	13.130	

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



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #103 - Allison #103 - Allison #103													Offset Site Error:	0.00 ft
Survey Program: 3353-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
4,700.00	3,253.00	3,253.00	3,253.00	61.89	6.85	90.00	-421.66	2,974.68	1,284.71	1,230.67	54.04	23.775		
4,800.00	3,253.00	3,253.00	3,253.00	65.50	6.85	90.00	-421.66	2,974.68	1,221.07	1,161.91	59.16	20.639		
4,900.00	3,252.99	3,252.99	3,252.99	69.16	6.85	90.01	-421.66	2,974.68	1,162.56	1,097.89	64.67	17.976		
5,000.00	3,252.95	3,252.95	3,252.95	72.85	6.85	90.02	-421.66	2,974.68	1,109.99	1,039.50	70.50	15.745		
5,100.00	3,252.88	3,252.88	3,252.88	76.57	6.85	90.02	-421.66	2,974.68	1,064.24	987.73	76.51	13.910		
5,200.00	3,252.78	3,252.78	3,252.78	80.33	6.85	90.03	-421.66	2,974.68	1,026.23	943.69	82.54	12.433		
5,300.00	3,252.64	3,252.64	3,252.64	84.11	6.85	90.02	-421.66	2,974.68	996.83	908.46	88.38	11.279		
5,400.00	3,252.47	3,252.47	3,252.47	87.91	6.85	90.02	-421.66	2,974.68	976.84	883.07	93.77	10.418		
5,500.00	3,252.26	3,252.26	3,252.26	91.72	6.85	90.01	-421.66	2,974.68	966.82	868.36	98.46	9.819		
5,547.34	3,252.15	3,252.15	3,252.15	93.54	6.85	90.00	-421.66	2,974.68	965.66	865.27	100.39	9.619 CC		
5,600.00	3,252.02	3,252.02	3,252.02	95.56	6.85	89.99	-421.66	2,974.68	967.09	864.83	102.27	9.457 ES		
5,700.00	3,251.75	3,251.75	3,251.75	99.40	6.85	89.97	-421.66	2,974.68	977.65	872.60	105.05	9.306 SF		
5,800.00	3,251.44	3,251.44	3,251.44	103.26	6.85	89.95	-421.66	2,974.68	998.16	891.37	106.80	9.346		
5,900.00	3,251.10	3,251.10	3,251.10	107.14	6.85	89.93	-421.66	2,974.68	1,028.04	920.47	107.57	9.557		
6,000.00	3,250.73	3,250.73	3,250.73	111.02	6.85	89.90	-421.66	2,974.68	1,066.49	958.98	107.50	9.920		
6,100.00	3,250.32	3,250.32	3,250.32	114.91	6.85	89.86	-421.66	2,974.68	1,112.62	1,005.86	106.76	10.422		
6,200.00	3,249.88	3,249.88	3,249.88	118.81	6.84	89.82	-421.66	2,974.68	1,165.52	1,060.01	105.52	11.046		
6,300.00	3,249.41	3,249.41	3,249.41	122.72	6.84	89.78	-421.66	2,974.68	1,224.33	1,120.40	103.92	11.781		
6,400.00	3,248.90	3,248.90	3,248.90	126.63	6.84	89.74	-421.66	2,974.68	1,288.22	1,186.11	102.10	12.617		

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



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #123S - Allison #123S LL - Allison #123S LL													Offset Site Error:	0.00 ft
Survey Program: 800-MWD													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		
2,500.00	2,482.19	4,448.02	3,284.36	8.94	71.98	-104.00	1,045.14	12.65	1,303.81	1,238.49	65.32	19.960		
2,600.00	2,571.90	4,483.56	3,284.19	9.60	73.38	-104.97	1,049.44	47.92	1,248.10	1,178.77	69.33	18.002		
2,700.00	2,658.32	4,536.59	3,283.47	10.51	75.48	-104.85	1,055.83	100.56	1,197.70	1,123.48	74.22	16.137		
2,800.00	2,741.02	4,582.77	3,283.42	11.69	77.31	-104.80	1,061.41	146.40	1,153.40	1,074.23	79.17	14.569		
2,900.00	2,819.60	4,628.88	3,283.87	13.17	79.14	-104.53	1,067.17	192.15	1,115.43	1,031.08	84.35	13.224		
3,000.00	2,893.67	4,703.28	3,284.21	14.95	82.09	-102.97	1,077.14	265.88	1,083.55	992.78	90.78	11.936		
3,100.00	2,962.88	4,778.94	3,283.49	17.02	85.10	-101.24	1,087.16	340.86	1,056.68	959.24	97.44	10.844		
3,200.00	3,026.89	4,850.37	3,283.46	19.37	87.95	-99.63	1,096.52	411.68	1,034.95	930.93	104.02	9.949		
3,300.00	3,085.39	4,911.00	3,283.24	21.98	90.36	-98.32	1,105.05	471.70	1,018.41	908.23	110.18	9.243		
3,400.00	3,138.08	5,013.52	3,284.34	24.84	94.44	-95.86	1,118.68	573.30	1,005.01	887.02	117.99	8.518		
3,500.00	3,184.72	5,106.07	3,283.14	27.92	98.14	-93.76	1,130.52	665.08	994.03	868.64	125.40	7.927		
3,600.00	3,223.63	5,186.40	3,281.50	30.03	101.35	-92.41	1,141.79	744.60	986.61	855.52	131.09	7.526		
3,700.00	3,246.82	5,308.00	3,280.56	31.69	106.21	-91.38	1,157.97	865.10	980.42	842.66	137.75	7.117		
3,800.00	3,253.00	5,387.00	3,280.18	33.79	109.37	-91.60	1,168.48	943.40	974.84	831.79	143.05	6.815		
3,900.00	3,253.00	5,461.94	3,280.47	36.21	112.36	-91.62	1,179.62	1,017.50	971.21	822.80	148.41	6.544		
4,000.00	3,253.00	5,559.40	3,281.05	38.90	116.25	-91.66	1,195.85	1,113.60	969.31	814.34	154.96	6.255		
4,100.00	3,253.00	5,657.49	3,282.96	41.80	120.15	-91.77	1,212.49	1,210.23	967.77	806.02	161.75	5.983		
4,200.00	3,253.00	5,791.38	3,284.16	44.88	125.52	-91.85	1,232.33	1,342.60	963.94	793.70	170.24	5.662		
4,300.00	3,253.00	5,894.00	3,281.37	48.09	129.64	-91.70	1,245.74	1,444.30	958.33	780.74	177.58	5.396		
4,400.00	3,253.00	6,030.15	3,279.08	51.42	135.13	-91.58	1,260.82	1,579.55	950.68	764.49	186.19	5.106		
4,500.00	3,253.00	6,109.14	3,279.48	54.84	138.32	-91.61	1,269.04	1,658.11	942.49	749.55	192.94	4.885		
4,600.00	3,253.00	6,187.26	3,279.46	58.33	141.47	-91.62	1,278.83	1,735.61	936.45	736.81	199.64	4.691		
4,700.00	3,253.00	6,282.88	3,280.43	61.89	145.31	-91.69	1,293.07	1,830.16	932.75	725.73	207.03	4.505		
4,800.00	3,253.00	6,388.14	3,280.57	65.50	149.54	-91.70	1,307.53	1,934.42	927.89	713.02	214.86	4.319		
4,900.00	3,252.99	6,512.51	3,281.36	69.16	154.56	-91.77	1,324.14	2,057.66	922.92	699.53	223.39	4.131		
5,000.00	3,252.95	6,602.47	3,284.49	72.85	158.19	-91.98	1,334.23	2,146.99	915.67	684.93	230.75	3.968		
5,100.00	3,252.88	6,734.85	3,285.45	76.57	163.56	-92.07	1,348.41	2,278.60	907.94	668.48	239.46	3.792		
5,200.00	3,252.78	6,840.31	3,284.86	80.33	167.84	-92.07	1,356.67	2,383.72	897.13	649.75	247.38	3.627		
5,300.00	3,252.64	6,947.83	3,283.42	84.11	172.21	-92.01	1,365.26	2,490.88	886.52	631.17	255.35	3.472		
5,400.00	3,252.47	7,059.12	3,282.93	87.91	176.75	-92.03	1,371.99	2,601.98	873.93	610.55	263.37	3.318		
5,500.00	3,252.26	7,151.60	3,280.86	91.72	180.51	-91.93	1,377.17	2,694.28	860.90	589.78	271.12	3.175		
5,600.00	3,252.02	7,241.27	3,279.44	95.56	184.16	-91.88	1,383.71	2,783.70	849.52	570.72	278.81	3.047		
5,700.00	3,251.75	7,332.08	3,277.87	99.40	187.86	-91.81	1,391.11	2,874.18	839.02	552.50	286.51	2.928		
5,800.00	3,251.44	7,383.00	3,277.58	103.26	189.92	-91.81	1,396.46	2,924.81	831.37	538.49	292.88	2.839		
5,900.00	3,251.10	7,488.45	3,281.03	107.14	194.16	-92.09	1,411.77	3,029.08	827.47	526.53	300.94	2.750		
6,000.00	3,250.73	7,594.54	3,283.57	111.02	198.46	-92.31	1,425.39	3,134.26	821.80	512.76	309.04	2.659		
6,100.00	3,250.32	7,709.18	3,285.15	114.91	203.10	-92.47	1,439.10	3,248.06	815.23	497.83	317.40	2.568		
6,200.00	3,249.88	7,856.31	3,282.87	118.81	209.10	-92.41	1,449.69	3,394.75	803.27	477.13	326.13	2.463		
6,300.00	3,249.41	7,898.00	3,281.59	122.72	210.80	-92.35	1,452.03	3,436.36	792.15	459.15	333.00	2.379		
6,348.08	3,249.17	7,898.00	3,281.59	124.60	210.80	-92.35	1,452.03	3,436.36	790.69	456.07	334.62	2.363	CC, ES, SF	
6,400.00	3,248.90	7,898.00	3,281.59	126.63	210.80	-92.35	1,452.03	3,436.36	792.39	457.40	334.99	2.365		
6,500.00	3,248.36	7,898.00	3,281.59	130.55	210.80	-92.35	1,452.03	3,436.36	805.15	473.37	331.78	2.427		
6,600.00	3,247.79	7,898.00	3,281.59	134.48	210.80	-92.34	1,452.03	3,436.36	829.86	505.87	323.98	2.561		
6,700.00	3,247.18	7,898.00	3,281.59	138.41	210.80	-92.33	1,452.03	3,436.36	865.48	552.80	312.67	2.768		
6,800.00	3,246.54	7,898.00	3,281.59	142.34	210.80	-92.33	1,452.03	3,436.36	910.74	611.65	299.09	3.045		
6,900.00	3,245.87	7,898.00	3,281.59	146.28	210.80	-92.31	1,452.03	3,436.36	964.28	679.92	284.36	3.391		
7,000.00	3,245.16	7,898.00	3,281.59	150.23	210.80	-92.30	1,452.03	3,436.36	1,024.81	755.45	269.36	3.805		
7,100.00	3,244.42	7,898.00	3,281.59	154.17	210.80	-92.28	1,452.03	3,436.36	1,091.16	836.47	254.69	4.284		
7,200.00	3,243.65	7,898.00	3,281.59	158.12	210.80	-92.26	1,452.03	3,436.36	1,162.34	921.61	240.73	4.828		
7,300.00	3,242.84	7,898.00	3,281.59	162.08	210.80	-92.24	1,452.03	3,436.36	1,237.52	1,009.86	227.66	5.436		

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



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #123S - Allison #123S MB - Allison #123S MB													Offset Site Error:	0.00 ft
Survey Program: 800-MWD													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		
2,600.00	2,571.90	4,170.00	3,282.60	9.60	60.88	-117.48	1,024.53	-266.95	1,295.95	1,237.70	58.26	22.246		
2,700.00	2,658.32	4,242.81	3,313.02	10.51	63.40	-117.22	1,031.78	-201.20	1,258.98	1,196.71	62.26	20.220		
2,800.00	2,741.02	4,322.42	3,346.12	11.69	66.15	-116.74	1,040.54	-129.33	1,227.04	1,160.30	66.74	18.386		
2,900.00	2,819.60	4,410.05	3,382.06	13.17	69.20	-116.09	1,050.71	-50.06	1,199.50	1,127.76	71.73	16.722		
3,000.00	2,893.67	4,460.00	3,402.22	14.95	70.95	-116.05	1,056.77	-4.76	1,176.74	1,100.88	75.86	15.512		
3,100.00	2,962.88	4,460.00	3,402.22	17.02	70.95	-116.51	1,056.77	-4.76	1,164.14	1,085.86	78.28	14.872		
3,158.32	3,000.86	4,460.00	3,402.22	18.39	70.95	-116.58	1,056.77	-4.76	1,162.15	1,082.64	79.51	14.616 CC, ES		
3,200.00	3,026.89	4,460.00	3,402.22	19.37	70.95	-116.54	1,056.77	-4.76	1,163.17	1,082.93	80.24	14.496		
3,300.00	3,085.39	4,460.00	3,402.22	21.98	70.95	-116.16	1,056.77	-4.76	1,173.85	1,082.19	81.66	14.375 SF		
3,400.00	3,138.08	4,460.00	3,402.22	24.84	70.95	-115.34	1,056.77	-4.76	1,195.83	1,113.32	82.51	14.493		
3,500.00	3,184.72	4,460.00	3,402.22	27.92	70.95	-114.09	1,056.77	-4.76	1,228.40	1,145.58	82.82	14.831		
3,600.00	3,223.63	4,460.00	3,402.22	30.03	70.95	-110.75	1,056.77	-4.76	1,271.10	1,189.20	81.90	15.520		



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #123S - Allison #123S UL - Allison #123S UL													Offset Site Error:	0.00 ft
Survey Program: 800-MWD, 3913-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							
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	Warning	
2,500.00	2,482.19	4,358.01	3,177.41	8.94	59.54	-104.24	1,069.90	-56.70	1,269.32	1,211.02	58.30	21.770		
2,600.00	2,571.90	4,412.64	3,178.90	9.60	60.85	-103.92	1,078.24	-2.72	1,221.85	1,159.97	61.88	19.746		
2,700.00	2,658.32	4,551.13	3,177.72	10.51	64.42	-99.67	1,096.01	134.57	1,178.94	1,111.33	67.62	17.436		
2,800.00	2,741.02	4,628.13	3,174.05	11.69	66.53	-97.98	1,102.64	211.19	1,138.70	1,066.29	72.40	15.727		
2,900.00	2,819.60	4,689.00	3,169.03	13.17	68.25	-96.76	1,107.52	271.66	1,103.38	1,026.25	77.14	14.304		
3,000.00	2,893.67	4,751.72	3,163.73	14.95	70.07	-95.30	1,113.03	333.91	1,074.39	992.28	82.11	13.085		
3,100.00	2,962.88	4,825.87	3,157.99	17.02	72.28	-93.27	1,118.47	407.64	1,050.08	962.60	87.48	12.004		
3,200.00	3,026.89	4,890.04	3,153.41	19.37	74.23	-91.59	1,123.20	471.47	1,030.88	938.20	92.67	11.124		
3,300.00	3,085.39	4,970.32	3,149.15	21.98	76.74	-89.35	1,129.98	551.34	1,016.84	918.54	98.29	10.345		
3,400.00	3,138.08	5,044.87	3,148.95	24.84	79.13	-87.55	1,135.29	625.69	1,005.20	901.41	103.78	9.686		
3,500.00	3,184.72	5,135.92	3,150.27	27.92	82.10	-85.52	1,142.93	716.41	996.70	886.94	109.77	9.080		
3,600.00	3,223.63	5,230.90	3,152.48	30.03	85.26	-84.05	1,150.55	811.05	988.93	874.13	114.80	8.614		
3,700.00	3,246.82	5,340.28	3,154.75	31.69	88.98	-83.58	1,157.78	920.17	979.02	859.15	119.87	8.167		
3,800.00	3,253.00	5,420.44	3,156.43	33.79	91.74	-84.25	1,163.93	1,000.08	968.51	843.75	124.76	7.763		
3,900.00	3,253.00	5,507.38	3,159.02	36.21	94.78	-84.35	1,171.43	1,086.65	958.35	828.08	130.27	7.357		
4,000.00	3,253.00	5,602.21	3,160.94	38.90	98.12	-84.42	1,180.88	1,180.98	949.55	813.25	136.30	6.967		
4,100.00	3,253.00	5,704.78	3,160.61	41.80	101.78	-84.34	1,191.11	1,283.04	940.98	798.19	142.78	6.590		
4,200.00	3,253.00	5,825.57	3,158.43	44.88	106.15	-84.13	1,201.52	1,403.35	931.27	781.30	149.97	6.210		
4,300.00	3,253.00	5,905.74	3,160.28	48.09	109.07	-84.20	1,208.41	1,483.21	921.09	764.87	156.22	5.896		
4,400.00	3,253.00	5,996.47	3,164.25	51.42	112.39	-84.40	1,217.86	1,573.35	912.51	749.59	162.92	5.601		
4,500.00	3,253.00	6,087.00	3,167.01	54.84	115.72	-84.53	1,227.94	1,663.27	904.79	735.08	169.71	5.331		
4,600.00	3,253.00	6,166.00	3,168.31	58.33	118.64	-84.59	1,238.02	1,741.61	898.82	722.69	176.13	5.103		
4,700.00	3,253.00	6,249.12	3,168.13	61.89	121.72	-84.55	1,250.02	1,823.86	894.75	712.06	182.69	4.898		
4,800.00	3,253.00	6,358.97	3,167.54	65.50	125.81	-84.49	1,266.64	1,932.44	891.38	701.02	190.36	4.683		
4,900.00	3,252.99	6,464.73	3,167.83	69.16	129.77	-84.49	1,281.82	2,037.10	887.14	689.20	197.95	4.482		
5,000.00	3,252.95	6,574.40	3,168.45	72.85	133.91	-84.49	1,296.34	2,145.80	881.75	676.02	205.73	4.286		
5,100.00	3,252.88	6,676.90	3,169.71	76.57	137.80	-84.54	1,308.63	2,247.55	875.01	661.70	213.31	4.102		
5,200.00	3,252.78	6,772.97	3,172.88	80.33	141.45	-84.72	1,321.15	2,342.74	869.16	648.40	220.76	3.937		
5,300.00	3,252.64	6,864.23	3,174.09	84.11	144.93	-84.78	1,333.38	2,433.17	863.86	635.84	228.02	3.789		
5,400.00	3,252.47	6,968.52	3,173.13	87.91	148.92	-84.70	1,347.82	2,536.45	859.22	623.48	235.73	3.645		
5,500.00	3,252.26	7,070.53	3,173.02	91.72	152.84	-84.67	1,361.29	2,637.56	853.84	610.42	243.42	3.508		
5,600.00	3,252.02	7,163.00	3,170.70	95.56	156.39	-84.51	1,374.02	2,729.12	849.22	598.50	250.72	3.387		
5,700.00	3,251.75	7,244.02	3,166.63	99.40	159.51	-84.23	1,385.76	2,809.17	845.65	588.17	257.48	3.284		
5,800.00	3,251.44	7,339.45	3,160.75	103.26	163.16	-83.83	1,401.21	2,903.17	843.91	579.16	264.75	3.188		
5,900.00	3,251.10	7,468.78	3,156.26	107.14	168.16	-83.52	1,419.83	3,031.03	840.02	566.56	273.46	3.072		
6,000.00	3,250.73	7,560.55	3,152.47	111.02	171.71	-83.25	1,432.69	3,121.82	835.86	555.14	280.73	2.978		
6,100.00	3,250.32	7,629.00	3,152.52	114.91	174.36	-83.26	1,443.64	3,189.38	833.32	546.27	287.05	2.903		
6,140.27	3,250.15	7,664.78	3,153.21	116.48	175.74	-83.32	1,450.31	3,224.52	833.25	543.29	289.95	2.874	CC	
6,200.00	3,249.88	7,710.76	3,154.54	118.81	177.50	-83.43	1,459.37	3,269.59	833.74	539.88	293.85	2.837		
6,300.00	3,249.41	7,795.62	3,154.69	122.72	180.75	-83.48	1,477.37	3,352.50	836.37	535.71	300.66	2.782		
6,400.00	3,248.90	7,872.00	3,152.64	126.63	183.67	-83.39	1,494.23	3,426.97	840.46	533.78	306.67	2.741	ES, SF	
6,500.00	3,248.36	7,872.00	3,152.64	130.55	183.67	-83.39	1,494.23	3,426.97	852.58	547.74	304.85	2.797		
6,600.00	3,247.79	7,872.00	3,152.64	134.48	183.67	-83.38	1,494.23	3,426.97	876.03	576.84	299.19	2.928		
6,700.00	3,247.18	7,872.00	3,152.64	138.41	183.67	-83.38	1,494.23	3,426.97	909.91	619.43	290.48	3.132		
6,800.00	3,246.54	7,872.00	3,152.64	142.34	183.67	-83.37	1,494.23	3,426.97	953.12	673.46	279.67	3.408		
6,900.00	3,245.87	7,872.00	3,152.64	146.28	183.67	-83.36	1,494.23	3,426.97	1,004.46	736.83	267.63	3.753		
7,000.00	3,245.16	7,872.00	3,152.64	150.23	183.67	-83.34	1,494.23	3,426.97	1,062.75	807.64	255.12	4.166		
7,100.00	3,244.42	7,872.00	3,152.64	154.17	183.67	-83.33	1,494.23	3,426.97	1,126.91	884.26	242.65	4.644		
7,200.00	3,243.65	7,872.00	3,152.64	158.12	183.67	-83.31	1,494.23	3,426.97	1,196.00	965.40	230.60	5.186		
7,300.00	3,242.84	7,872.00	3,152.64	162.08	183.67	-83.29	1,494.23	3,426.97	1,269.21	1,050.04	219.17	5.791		

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

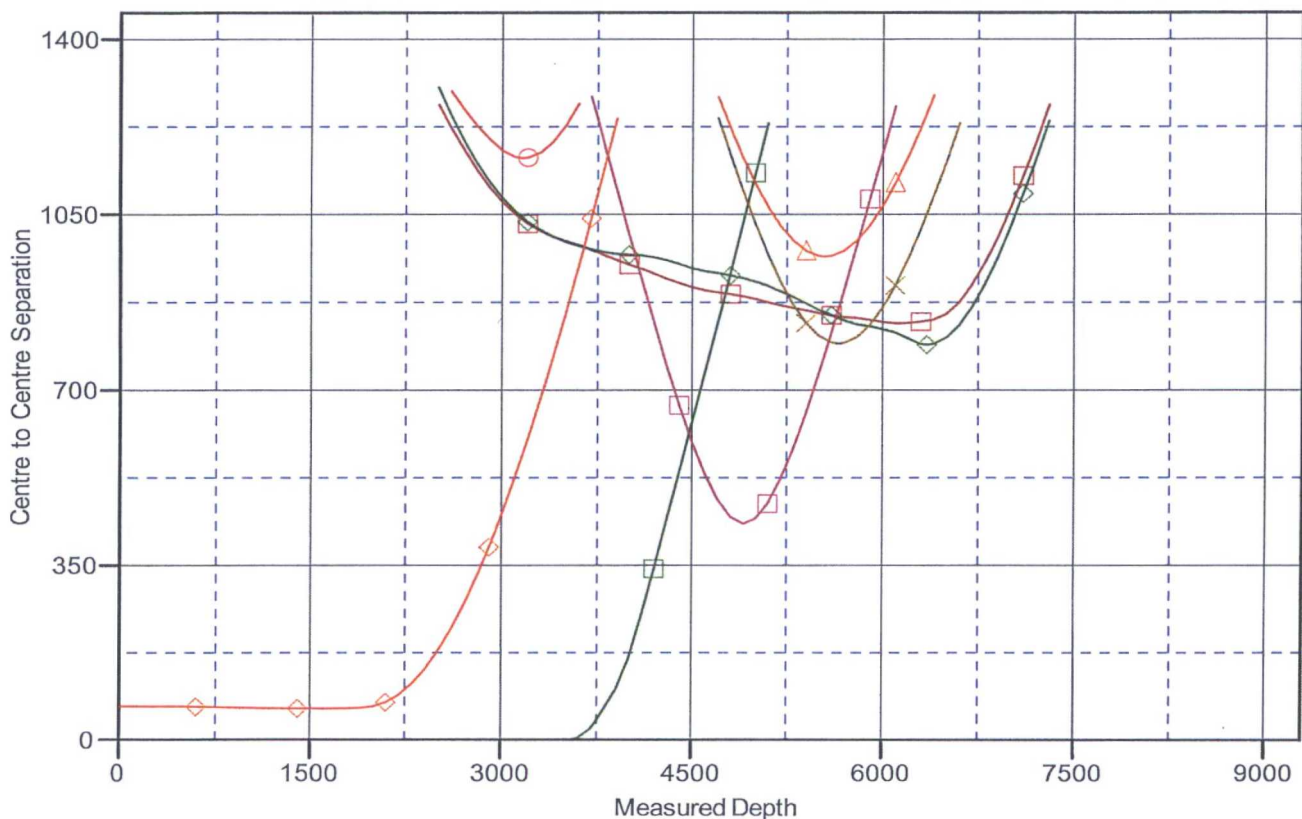
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to rig @ 6644.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #123H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.16°

Ladder Plot



LEGEND

Jnt #123H, Pilot, Design #1 V0
Jnt #123S, Allison #123S UL, Allison #123S UL V0
Jnt #123S, Allison #123S MB, Allison #123S MB V0
Allison Unit #123S, Allison #123S LL, Allison #123S LL V0
Allison Unit #026M, Allison #026M, Allison #026M V0
Allison Unit #026, Allison #026, Allison #026 V0
Allison Unit #055, Allison #055, Allison #055 V0
Allison Unit #103, Allison #103, Allison #103 V0



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to rig @ 6644.00ft

Offset Depths are relative to Offset Datum

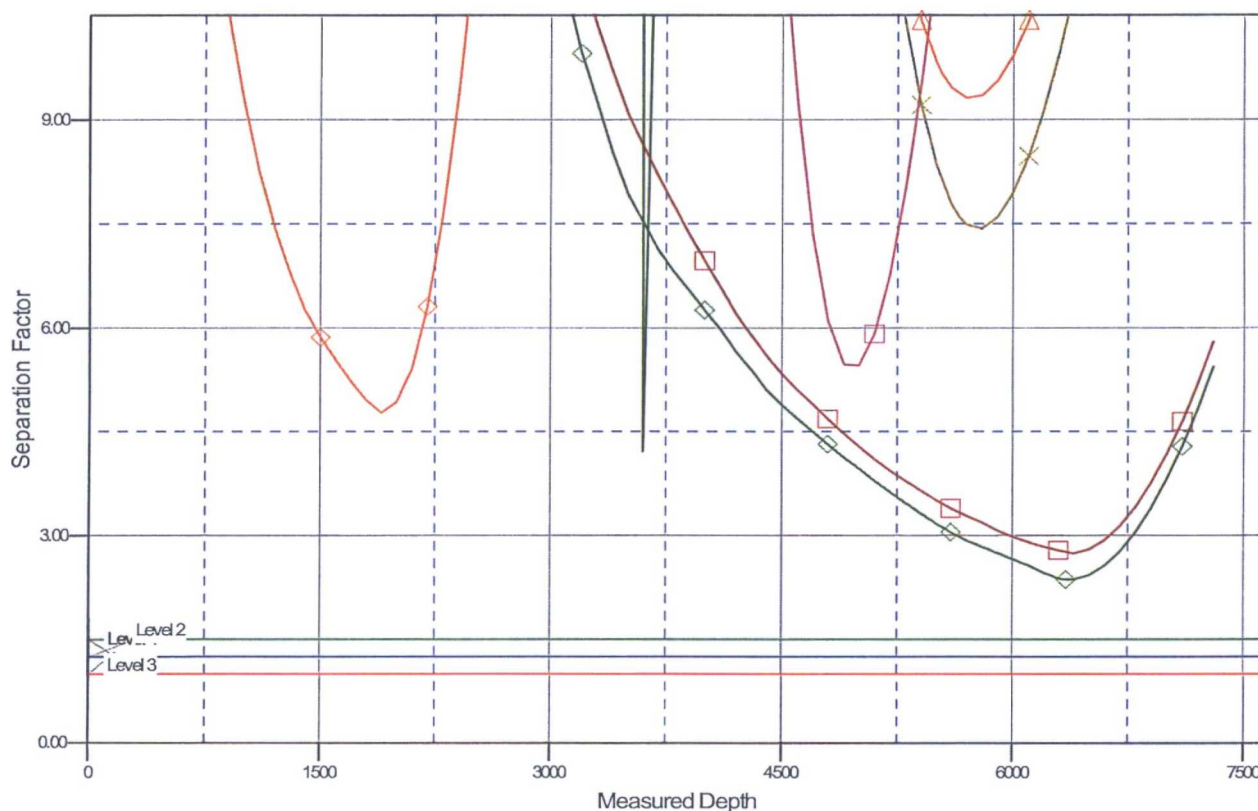
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #123H

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

Grid Convergence at Surface is: 0.16°

Separation Factor Plot



LEGEND

Jnt #123H, Pilot, Design #1 V0

Jnt #123S, Allison #123S UL, Allison #123S UL V0

Jnt #123S, Allison #123S MB, Allison #123S MB V0

◆ Allison Unit #123S, Allison #123S LL, Allison #123S LL V0

■ Allison Unit #026M, Allison #026M, Allison #026M V0

◆ Allison Unit #026, Allison #026, Allison #026 V0

✱ Allison Unit #055, Allison #055, Allison #055 V0

▲ Allison Unit #103, Allison #103, Allison #103 V0

▲ Allison Unit #103M, Allison #103M, Allison #103M V0



HILCORP ENERGY COMPANY
ALLISON UNIT #123H (HORZ ST02)
SAN JUAN BASIN NM
6629' GL + 15' KB



WELL DETAILS: Allison Unit #123H

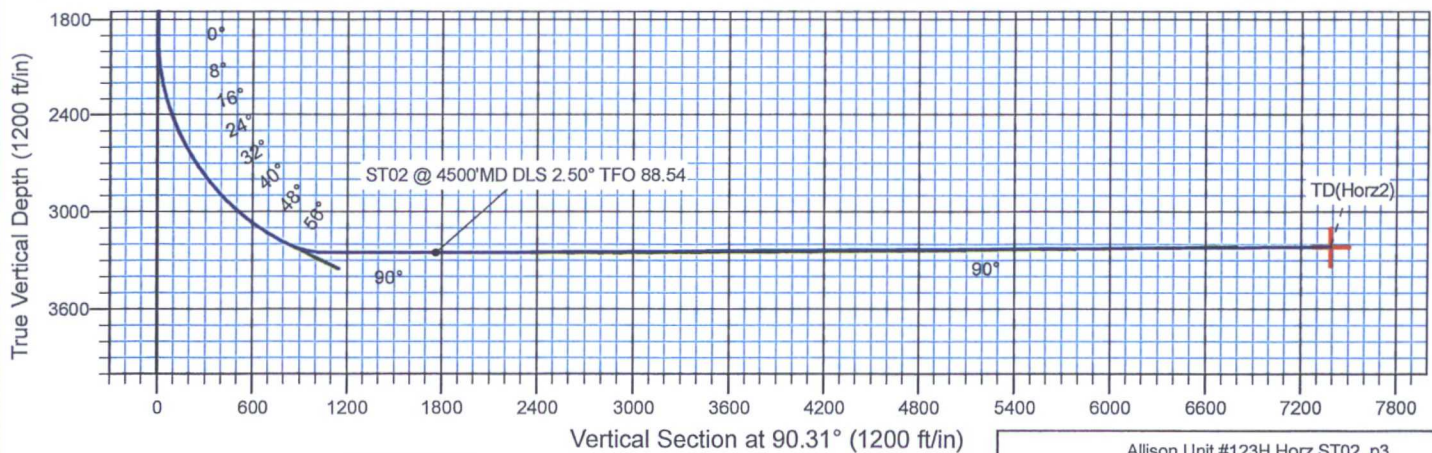
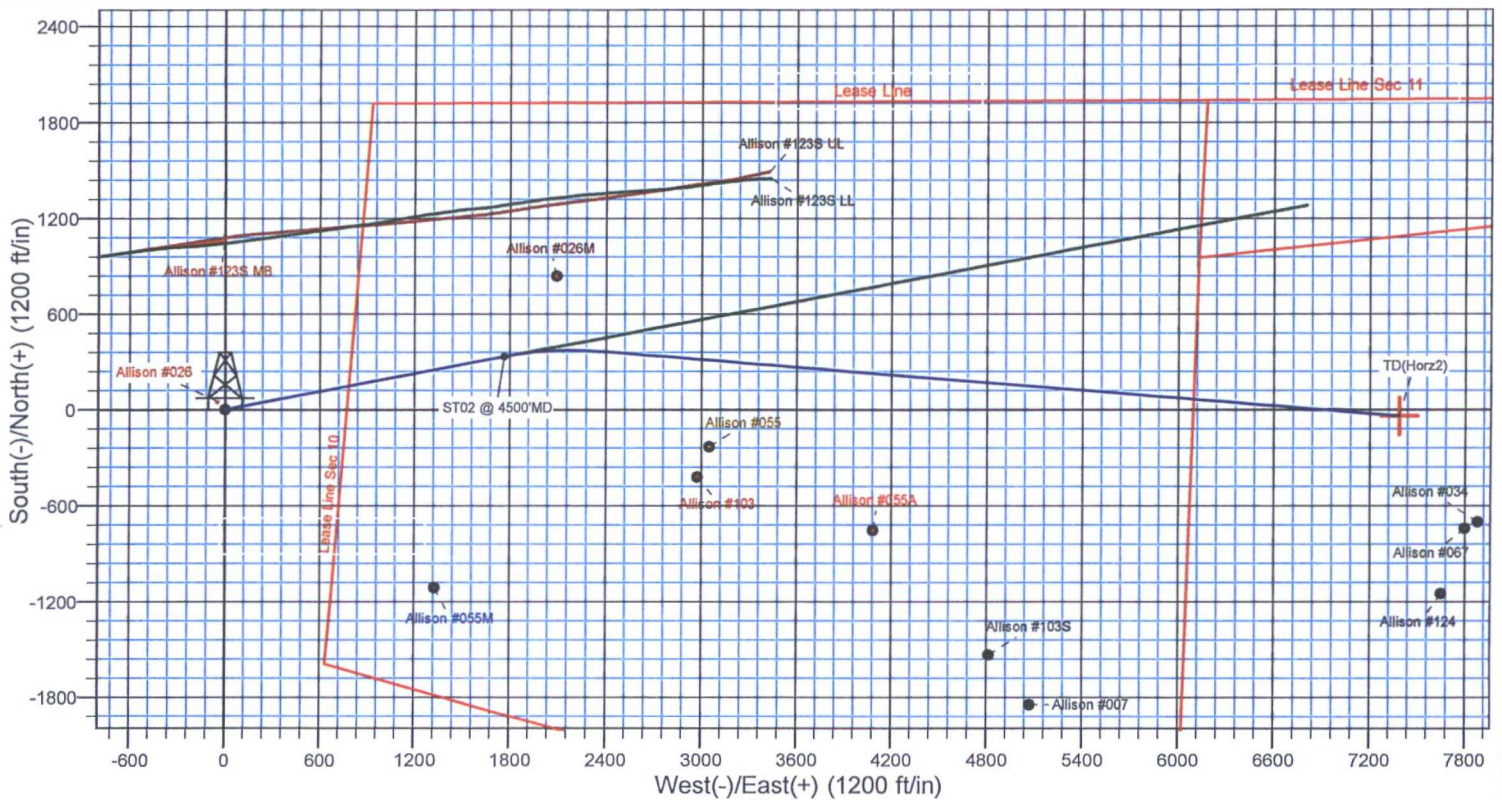
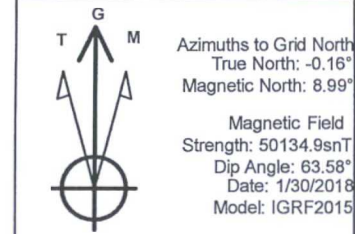
+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.00	0.00	2181465.680	6629.00	578341.970	36° 59' 41.070 N	107° 33' 54.258 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	4500.00	90.00	79.32	3253.00	333.18	1766.52	0.00	0.00	1764.71	
2	5112.27	90.39	94.62	3250.92	365.44	2376.12	2.50	88.54	2374.12	
3	10139.76	90.39	94.62	3217.00	-39.68	7387.14	0.00	0.00	7387.25	TD(Horz2)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD(Horz2)	3217.00	-39.68	7387.14	2181426.000	585729.100	36° 59' 40.462 N	107° 32' 23.197 W	Point



Allison Unit #123H Horz ST02 p3

Created By: Frank Scardino Date: 1/31/2018
 Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Horz 2

Plan: Design #3

Standard Planning Report

31 January, 2018





Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz 2		
Design:	Design #3		

Project	San Juan County, NM		
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	Allison Unit #123H		
Site Position:		Northing:	2,181,465.680 usft
From:	Map	Easting:	578,341.970 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 59' 41.070 N
		Longitude:	107° 33' 54.258 W
		Grid Convergence:	0.16 °

Well	Allison Unit #123H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	36° 59' 41.070 N
		Longitude:	107° 33' 54.258 W
		Ground Level:	6,629.00 ft

Wellbore	Horz 2		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	1/30/2018	9.15
			Dip Angle (°)
			63.58
			Field Strength (nT)
			50,135

Design	Design #3		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			4,500.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction (°)
			90.31

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
4,500.00	90.00	79.32	3,253.00	333.18	1,766.52	0.00	0.00	0.00	0.00	
5,112.27	90.39	94.62	3,250.92	365.44	2,376.12	2.50	0.06	2.50	88.54	
10,139.76	90.39	94.62	3,217.00	-39.68	7,387.14	0.00	0.00	0.00	0.00	TD(Horz2)



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz 2		
Design:	Design #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,500.00	90.00	79.32	3,253.00	333.18	1,766.52	1,764.71	0.00	0.00	0.00
ST02 @ 4500'MD DLS 2.50° TFO 88.54									
4,600.00	90.06	81.82	3,252.94	349.56	1,865.17	1,863.26	2.50	0.06	2.50
4,700.00	90.13	84.32	3,252.78	361.63	1,964.43	1,962.46	2.50	0.06	2.50
4,800.00	90.19	86.82	3,252.50	369.36	2,064.12	2,062.11	2.50	0.06	2.50
4,900.00	90.25	89.32	3,252.11	372.73	2,164.05	2,162.02	2.50	0.06	2.50
5,000.00	90.32	91.82	3,251.61	371.74	2,264.04	2,262.01	2.50	0.06	2.50
5,100.00	90.38	94.32	3,251.00	366.39	2,363.89	2,361.88	2.50	0.06	2.50
5,112.27	90.39	94.62	3,250.92	365.44	2,376.12	2,374.12	2.50	0.06	2.50
5,200.00	90.39	94.62	3,250.33	358.37	2,463.56	2,461.60	0.00	0.00	0.00
5,300.00	90.39	94.62	3,249.66	350.31	2,563.23	2,561.32	0.00	0.00	0.00
5,400.00	90.39	94.62	3,248.98	342.25	2,662.91	2,661.03	0.00	0.00	0.00
5,500.00	90.39	94.62	3,248.31	334.19	2,762.58	2,760.74	0.00	0.00	0.00
5,600.00	90.39	94.62	3,247.63	326.14	2,862.25	2,860.46	0.00	0.00	0.00
5,700.00	90.39	94.62	3,246.96	318.08	2,961.92	2,960.17	0.00	0.00	0.00
5,800.00	90.39	94.62	3,246.28	310.02	3,061.60	3,059.89	0.00	0.00	0.00
5,900.00	90.39	94.62	3,245.61	301.96	3,161.27	3,159.60	0.00	0.00	0.00
6,000.00	90.39	94.62	3,244.93	293.90	3,260.94	3,259.32	0.00	0.00	0.00
6,100.00	90.39	94.62	3,244.26	285.85	3,360.61	3,359.03	0.00	0.00	0.00
6,200.00	90.39	94.62	3,243.58	277.79	3,460.29	3,458.74	0.00	0.00	0.00
6,300.00	90.39	94.62	3,242.91	269.73	3,559.96	3,558.46	0.00	0.00	0.00
6,400.00	90.39	94.62	3,242.23	261.67	3,659.63	3,658.17	0.00	0.00	0.00
6,500.00	90.39	94.62	3,241.56	253.61	3,759.30	3,757.89	0.00	0.00	0.00
6,600.00	90.39	94.62	3,240.88	245.56	3,858.98	3,857.60	0.00	0.00	0.00
6,700.00	90.39	94.62	3,240.21	237.50	3,958.65	3,957.32	0.00	0.00	0.00
6,800.00	90.39	94.62	3,239.53	229.44	4,058.32	4,057.03	0.00	0.00	0.00
6,900.00	90.39	94.62	3,238.86	221.38	4,157.99	4,156.75	0.00	0.00	0.00
7,000.00	90.39	94.62	3,238.19	213.32	4,257.67	4,256.46	0.00	0.00	0.00
7,100.00	90.39	94.62	3,237.51	205.27	4,357.34	4,356.17	0.00	0.00	0.00
7,200.00	90.39	94.62	3,236.84	197.21	4,457.01	4,455.89	0.00	0.00	0.00
7,300.00	90.39	94.62	3,236.16	189.15	4,556.68	4,555.60	0.00	0.00	0.00
7,400.00	90.39	94.62	3,235.49	181.09	4,656.36	4,655.32	0.00	0.00	0.00
7,500.00	90.39	94.62	3,234.81	173.03	4,756.03	4,755.03	0.00	0.00	0.00
7,600.00	90.39	94.62	3,234.14	164.97	4,855.70	4,854.75	0.00	0.00	0.00
7,700.00	90.39	94.62	3,233.46	156.92	4,955.37	4,954.46	0.00	0.00	0.00
7,800.00	90.39	94.62	3,232.79	148.86	5,055.05	5,054.17	0.00	0.00	0.00
7,900.00	90.39	94.62	3,232.11	140.80	5,154.72	5,153.89	0.00	0.00	0.00
8,000.00	90.39	94.62	3,231.44	132.74	5,254.39	5,253.60	0.00	0.00	0.00
8,100.00	90.39	94.62	3,230.76	124.68	5,354.06	5,353.32	0.00	0.00	0.00
8,200.00	90.39	94.62	3,230.09	116.63	5,453.74	5,453.03	0.00	0.00	0.00
8,300.00	90.39	94.62	3,229.41	108.57	5,553.41	5,552.75	0.00	0.00	0.00
8,400.00	90.39	94.62	3,228.74	100.51	5,653.08	5,652.46	0.00	0.00	0.00
8,500.00	90.39	94.62	3,228.06	92.45	5,752.76	5,752.18	0.00	0.00	0.00
8,600.00	90.39	94.62	3,227.39	84.39	5,852.43	5,851.89	0.00	0.00	0.00
8,700.00	90.39	94.62	3,226.71	76.34	5,952.10	5,951.60	0.00	0.00	0.00
8,800.00	90.39	94.62	3,226.04	68.28	6,051.77	6,051.32	0.00	0.00	0.00
8,900.00	90.39	94.62	3,225.37	60.22	6,151.45	6,151.03	0.00	0.00	0.00
9,000.00	90.39	94.62	3,224.69	52.16	6,251.12	6,250.75	0.00	0.00	0.00
9,100.00	90.39	94.62	3,224.02	44.10	6,350.79	6,350.46	0.00	0.00	0.00
9,200.00	90.39	94.62	3,223.34	36.05	6,450.46	6,450.18	0.00	0.00	0.00
9,300.00	90.39	94.62	3,222.67	27.99	6,550.14	6,549.89	0.00	0.00	0.00
9,400.00	90.39	94.62	3,221.99	19.93	6,649.81	6,649.60	0.00	0.00	0.00
9,500.00	90.39	94.62	3,221.32	11.87	6,749.48	6,749.32	0.00	0.00	0.00
9,600.00	90.39	94.62	3,220.64	3.81	6,849.15	6,849.03	0.00	0.00	0.00



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz 2		
Design:	Design #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,700.00	90.39	94.62	3,219.97	-4.24	6,948.83	6,948.75	0.00	0.00	0.00
9,800.00	90.39	94.62	3,219.29	-12.30	7,048.50	7,048.46	0.00	0.00	0.00
9,900.00	90.39	94.62	3,218.62	-20.36	7,148.17	7,148.18	0.00	0.00	0.00
10,000.00	90.39	94.62	3,217.94	-28.42	7,247.84	7,247.89	0.00	0.00	0.00
10,100.00	90.39	94.62	3,217.27	-36.48	7,347.52	7,347.61	0.00	0.00	0.00
10,139.76	90.39	94.62	3,217.00	-39.68	7,387.14	7,387.25	0.00	0.00	0.00
TD(Horz2)									

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									
TD(Horz2)	0.00	0.00	3,217.00	-39.68	7,387.14	2,181,426.000	585,729.100	36° 59' 40.462 N	107° 32' 23.197 W
- plan hits target center									
- Point									

Casing Points						Casing Diameter (in)	Hole Diameter (in)
Measured Depth (ft)	Vertical Depth (ft)	Name					
500.00	500.00	9 5/8"				9.625	12.250

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,500.00	3,253.00	333.18	1,766.52	ST02 @ 4500'MD DLS 2.50° TFO 88.54



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Horz 2

Plan: Design #3

Standard Planning Report - Geographic

31 January, 2018





Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz 2		
Design:	Design #3		

Project	San Juan County, NM		
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		Allison Unit #123H			
Site Position:		Northing:	2,181,465.680 usft	Latitude:	36° 59' 41.070 N
From:	Map	Easting:	578,341.970 usft	Longitude:	107° 33' 54.258 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.16 °

Well	Allison Unit #123H					
Well Position	+N/-S	0.00 ft	Northing:	2,181,465.680 usft	Latitude:	36° 59' 41.070 N
	+E/-W	0.00 ft	Easting:	578,341.970 usft	Longitude:	107° 33' 54.258 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	6,629.00 ft

Wellbore	Horz 2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/30/2018	9.15	63.58	50,135

Design	Design #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	4,500.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	90.31

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
4,500.00	90.00	79.32	3,253.00	333.18	1,766.52	0.00	0.00	0.00	0.00	
5,112.27	90.39	94.62	3,250.92	365.44	2,376.12	2.50	0.06	2.50	88.54	
10,139.76	90.39	94.62	3,217.00	-39.68	7,387.14	0.00	0.00	0.00	0.00	TD(Horz2)



Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz 2		
Design:	Design #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,500.00	90.00	79.32	3,253.00	333.18	1,766.52	2,181,798.859	580,108.491	36° 59' 44.315 N	107° 33' 32.470 W
ST02 @ 4500'MD DLS 2.50° TFO 88.54									
4,600.00	90.06	81.82	3,252.94	349.56	1,865.17	2,181,815.243	580,207.132	36° 59' 44.474 N	107° 33' 31.253 W
4,700.00	90.13	84.32	3,252.78	361.63	1,964.43	2,181,827.310	580,306.393	36° 59' 44.591 N	107° 33' 30.029 W
4,800.00	90.19	86.82	3,252.50	369.36	2,064.12	2,181,835.037	580,406.085	36° 59' 44.664 N	107° 33' 28.800 W
4,900.00	90.25	89.32	3,252.11	372.73	2,164.05	2,181,838.409	580,506.019	36° 59' 44.695 N	107° 33' 27.568 W
5,000.00	90.32	91.82	3,251.61	371.74	2,264.04	2,181,837.421	580,606.005	36° 59' 44.682 N	107° 33' 26.336 W
5,100.00	90.38	94.32	3,251.00	366.39	2,363.89	2,181,832.073	580,705.852	36° 59' 44.626 N	107° 33' 25.105 W
5,112.27	90.39	94.62	3,250.92	365.44	2,376.12	2,181,831.117	580,718.087	36° 59' 44.616 N	107° 33' 24.954 W
5,200.00	90.39	94.62	3,250.33	358.37	2,463.56	2,181,824.048	580,805.527	36° 59' 44.544 N	107° 33' 23.877 W
5,300.00	90.39	94.62	3,249.66	350.31	2,563.23	2,181,815.990	580,905.199	36° 59' 44.461 N	107° 33' 22.648 W
5,400.00	90.39	94.62	3,248.98	342.25	2,662.91	2,181,807.932	581,004.872	36° 59' 44.379 N	107° 33' 21.420 W
5,500.00	90.39	94.62	3,248.31	334.19	2,762.58	2,181,799.874	581,104.544	36° 59' 44.296 N	107° 33' 20.191 W
5,600.00	90.39	94.62	3,247.63	326.14	2,862.25	2,181,791.816	581,204.216	36° 59' 44.214 N	107° 33' 18.963 W
5,700.00	90.39	94.62	3,246.96	318.08	2,961.92	2,181,783.758	581,303.889	36° 59' 44.131 N	107° 33' 17.735 W
5,800.00	90.39	94.62	3,246.28	310.02	3,061.60	2,181,775.700	581,403.561	36° 59' 44.049 N	107° 33' 16.506 W
5,900.00	90.39	94.62	3,245.61	301.96	3,161.27	2,181,767.642	581,503.233	36° 59' 43.966 N	107° 33' 15.278 W
6,000.00	90.39	94.62	3,244.93	293.90	3,260.94	2,181,759.584	581,602.906	36° 59' 43.883 N	107° 33' 14.049 W
6,100.00	90.39	94.62	3,244.26	285.85	3,360.61	2,181,751.526	581,702.578	36° 59' 43.801 N	107° 33' 12.821 W
6,200.00	90.39	94.62	3,243.58	277.79	3,460.29	2,181,743.467	581,802.250	36° 59' 43.718 N	107° 33' 11.593 W
6,300.00	90.39	94.62	3,242.91	269.73	3,559.96	2,181,735.409	581,901.923	36° 59' 43.636 N	107° 33' 10.364 W
6,400.00	90.39	94.62	3,242.23	261.67	3,659.63	2,181,727.351	582,001.595	36° 59' 43.553 N	107° 33' 9.136 W
6,500.00	90.39	94.62	3,241.56	253.61	3,759.30	2,181,719.293	582,101.267	36° 59' 43.471 N	107° 33' 7.907 W
6,600.00	90.39	94.62	3,240.88	245.56	3,858.98	2,181,711.235	582,200.940	36° 59' 43.388 N	107° 33' 6.679 W
6,700.00	90.39	94.62	3,240.21	237.50	3,958.65	2,181,703.177	582,300.612	36° 59' 43.305 N	107° 33' 5.451 W
6,800.00	90.39	94.62	3,239.53	229.44	4,058.32	2,181,695.119	582,400.284	36° 59' 43.223 N	107° 33' 4.222 W
6,900.00	90.39	94.62	3,238.86	221.38	4,157.99	2,181,687.061	582,499.957	36° 59' 43.140 N	107° 33' 2.994 W
7,000.00	90.39	94.62	3,238.19	213.32	4,257.67	2,181,679.003	582,599.629	36° 59' 43.058 N	107° 33' 1.765 W
7,100.00	90.39	94.62	3,237.51	205.27	4,357.34	2,181,670.945	582,699.301	36° 59' 42.975 N	107° 33' 0.537 W
7,200.00	90.39	94.62	3,236.84	197.21	4,457.01	2,181,662.887	582,798.973	36° 59' 42.892 N	107° 33' 59.309 W
7,300.00	90.39	94.62	3,236.16	189.15	4,556.68	2,181,654.829	582,898.646	36° 59' 42.810 N	107° 32' 58.080 W
7,400.00	90.39	94.62	3,235.49	181.09	4,656.36	2,181,646.771	582,998.318	36° 59' 42.727 N	107° 32' 56.852 W
7,500.00	90.39	94.62	3,234.81	173.03	4,756.03	2,181,638.713	583,097.990	36° 59' 42.644 N	107° 32' 55.624 W
7,600.00	90.39	94.62	3,234.14	164.97	4,855.70	2,181,630.655	583,197.663	36° 59' 42.562 N	107° 32' 54.395 W
7,700.00	90.39	94.62	3,233.46	156.92	4,955.37	2,181,622.597	583,297.335	36° 59' 42.479 N	107° 32' 53.167 W
7,800.00	90.39	94.62	3,232.79	148.86	5,055.05	2,181,614.539	583,397.007	36° 59' 42.397 N	107° 32' 51.938 W
7,900.00	90.39	94.62	3,232.11	140.80	5,154.72	2,181,606.481	583,496.680	36° 59' 42.314 N	107° 32' 50.710 W
8,000.00	90.39	94.62	3,231.44	132.74	5,254.39	2,181,598.423	583,596.352	36° 59' 42.231 N	107° 32' 49.482 W
8,100.00	90.39	94.62	3,230.76	124.68	5,354.06	2,181,590.365	583,696.024	36° 59' 42.149 N	107° 32' 48.253 W
8,200.00	90.39	94.62	3,230.09	116.63	5,453.74	2,181,582.307	583,795.697	36° 59' 42.066 N	107° 32' 47.025 W
8,300.00	90.39	94.62	3,229.41	108.57	5,553.41	2,181,574.249	583,895.369	36° 59' 41.983 N	107° 32' 45.796 W
8,400.00	90.39	94.62	3,228.74	100.51	5,653.08	2,181,566.191	583,995.041	36° 59' 41.901 N	107° 32' 44.568 W
8,500.00	90.39	94.62	3,228.06	92.45	5,752.76	2,181,558.133	584,094.714	36° 59' 41.818 N	107° 32' 43.340 W
8,600.00	90.39	94.62	3,227.39	84.39	5,852.43	2,181,550.075	584,194.386	36° 59' 41.735 N	107° 32' 42.111 W
8,700.00	90.39	94.62	3,226.71	76.34	5,952.10	2,181,542.017	584,294.058	36° 59' 41.653 N	107° 32' 40.883 W
8,800.00	90.39	94.62	3,226.04	68.28	6,051.77	2,181,533.959	584,393.731	36° 59' 41.570 N	107° 32' 39.655 W
8,900.00	90.39	94.62	3,225.37	60.22	6,151.45	2,181,525.901	584,493.403	36° 59' 41.487 N	107° 32' 38.426 W
9,000.00	90.39	94.62	3,224.69	52.16	6,251.12	2,181,517.843	584,593.075	36° 59' 41.405 N	107° 32' 37.198 W
9,100.00	90.39	94.62	3,224.02	44.10	6,350.79	2,181,509.785	584,692.748	36° 59' 41.322 N	107° 32' 35.969 W
9,200.00	90.39	94.62	3,223.34	36.05	6,450.46	2,181,501.727	584,792.420	36° 59' 41.239 N	107° 32' 34.741 W
9,300.00	90.39	94.62	3,222.67	27.99	6,550.14	2,181,493.668	584,892.092	36° 59' 41.157 N	107° 32' 33.513 W
9,400.00	90.39	94.62	3,221.99	19.93	6,649.81	2,181,485.610	584,991.765	36° 59' 41.074 N	107° 32' 32.284 W
9,500.00	90.39	94.62	3,221.32	11.87	6,749.48	2,181,477.552	585,091.437	36° 59' 40.991 N	107° 32' 31.056 W
9,600.00	90.39	94.62	3,220.64	3.81	6,849.15	2,181,469.494	585,191.109	36° 59' 40.909 N	107° 32' 29.828 W



Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #123H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6644.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6644.00ft
Site:	Allison Unit #123H	North Reference:	Grid
Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Horz 2		
Design:	Design #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,700.00	90.39	94.62	3,219.97	-4.24	6,948.83	2,181,461.436	585,290.782	36° 59' 40.826 N	107° 32' 28.599 W
9,800.00	90.39	94.62	3,219.29	-12.30	7,048.50	2,181,453.378	585,390.454	36° 59' 40.743 N	107° 32' 27.371 W
9,900.00	90.39	94.62	3,218.62	-20.36	7,148.17	2,181,445.320	585,490.126	36° 59' 40.660 N	107° 32' 26.143 W
10,000.00	90.39	94.62	3,217.94	-28.42	7,247.84	2,181,437.262	585,589.799	36° 59' 40.578 N	107° 32' 24.914 W
10,100.00	90.39	94.62	3,217.27	-36.48	7,347.52	2,181,429.204	585,689.471	36° 59' 40.495 N	107° 32' 23.686 W
10,139.76	90.39	94.62	3,217.00	-39.68	7,387.14	2,181,426.000	585,729.100	36° 59' 40.462 N	107° 32' 23.197 W
TD(Horz2)									

Design Targets									
Target Name									
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
TD(Horz2)	0.00	0.00	3,217.00	-39.68	7,387.14	2,181,426.000	585,729.100	36° 59' 40.462 N	107° 32' 23.197 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)		Name	Casing Diameter (in)	Hole Diameter (in)
500.00	500.00	9 5/8"		9.625	12.250

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,500.00	3,253.00	333.18	1,766.52	ST02 @ 4500'MD DLS 2.50° TFO 88.54



Hilcorp Energy Company

San Juan County, NM

Allison Unit #123H

Allison Unit #123H

Horz 2

Design #3

Anticollision Report

31 January, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Reference	Design #3		
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 center-center distance of 200.00 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/31/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	3,534.20	Design #1 (Pilot)	MWD	MWD - Standard	
3,534.20	4,500.00	Design #1 (Horz)	MWD	MWD - Standard	
4,500.00	10,139.76	Design #3 (Horz 2)	MWD	MWD - Standard	

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						
Allison Unit #123H						
Allison Unit #123H - Horz - Design #1	4,900.00	4,897.97	34.82	12.41	1.554	CC, ES, SF
Allison Unit #123H - Pilot - Design #1	3,900.00	3,881.30	102.61	99.81	36.674	CC, ES, SF
Allison Unit #123H Offsets						
Allison Unit #007 - Allison #007 - Allison #007						Out of range
Allison Unit #026 - Allison #026 - Allison #026	1,609.33	1,609.35	63.94	52.33	5.509	CC
Allison Unit #026 - Allison #026 - Allison #026	1,800.00	1,799.69	64.55	51.53	4.958	ES
Allison Unit #026 - Allison #026 - Allison #026	1,900.00	1,899.52	65.20	51.53	4.772	SF
Allison Unit #026M - Allison #026M - Allison #026M						Out of range
Allison Unit #034 - Allison #034 - Allison #034						Out of range
Allison Unit #055 - Allison #055 - Allison #055						Out of range
Allison Unit #055A - Allison #055A - Allison #055A						Out of range
Allison Unit #055M - Allison #055M - Allison #055M						Out of range
Allison Unit #067 - Allison #067 - Allison #067						Out of range
Allison Unit #103 - Allison #103 - Allison #103						Out of range
Allison Unit #103S - Allison #103S - Allison #103S						Out of range
Allison Unit #123S - Allison #123S LL - Allison #123S LL						Out of range
Allison Unit #123S - Allison #123S MB - Allison #123S M						Out of range
Allison Unit #123S - Allison #123S UL - Allison #123S UL						Out of range
Allison Unit #124 - Allison #124 - Allison #124						Out of range

Offset Design	Allison Unit #123H - Allison Unit #123H - Horz - Design #1												Offset Site Error:	0.00 ft
Survey Program:	O-MWD, 3534-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis			Distance									
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	Warning	
4,500.00	3,253.00	4,500.00	3,253.00	0.00	0.00	0.00	333.18	1,766.52	0.00	0.00	0.00	N/A		
4,510.37	3,253.00	4,510.37	3,253.00	0.26	0.36	-91.46	335.10	1,776.72	0.02	-0.60	0.62	0.038 Level 1		
4,600.00	3,252.94	4,599.97	3,253.00	2.49	3.50	-91.46	351.71	1,864.76	2.18	-3.80	5.98	0.365 Level 1		
4,700.00	3,252.78	4,699.75	3,253.00	4.16	7.05	-91.46	370.20	1,962.81	8.72	-2.48	11.20	0.778 Level 1		
4,800.00	3,252.50	4,799.14	3,253.00	6.07	10.64	-91.45	388.62	2,060.49	19.61	2.92	16.69	1.175 Level 2		
4,900.00	3,252.11	4,897.97	3,252.99	8.18	14.25	-91.43	406.93	2,157.60	34.82	12.41	22.40	1.554 CC, ES, SF		

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



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H - Allison Unit #123H - Horz - Design #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD, 3534-MWD												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	3,251.61	4,996.04	3,252.96	10.50	17.87	-91.38	425.11	2,253.98	54.32	26.02	28.31	1.919	
5,100.00	3,251.00	5,093.17	3,252.89	12.98	21.49	-91.33	443.11	2,349.42	78.09	43.72	34.37	2.272	
5,200.00	3,250.33	5,189.63	3,252.79	15.63	25.11	-91.29	460.98	2,444.21	104.45	63.88	40.58	2.574	
5,300.00	3,249.66	5,286.09	3,252.66	18.42	28.75	-91.26	478.86	2,539.00	130.85	83.90	46.94	2.787	
5,400.00	3,248.98	5,382.54	3,252.50	21.33	32.42	-91.22	496.73	2,633.78	157.24	103.79	53.46	2.942	
5,500.00	3,248.31	5,479.00	3,252.31	24.36	36.09	-91.19	514.61	2,728.57	183.64	123.54	60.09	3.056	



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H - Allison Unit #123H - Pilot - Design #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation		
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)			
3,534.20	3,198.93	3,534.20	3,199.30	0.00	0.00	-179.99	155.65	825.18	0.41	0.41	0.00	N/A		
3,600.00	3,223.63	3,599.86	3,227.05	1.39	2.14	-180.00	166.68	883.65	3.77	2.88	0.90	4.212		
3,700.00	3,246.82	3,697.70	3,268.40	3.05	5.35	-180.00	183.11	970.79	23.82	22.22	1.59	14.947		
3,800.00	3,253.00	3,790.67	3,307.69	5.15	8.44	-180.00	198.73	1,053.59	60.35	58.07	2.27	26.551		
3,900.00	3,253.00	3,881.30	3,345.99	7.58	11.47	-180.00	213.96	1,134.30	102.61	99.81	2.80	36.674		
4,000.00	3,253.00	3,897.87	3,353.00	10.27	12.02	-180.00	216.74	1,149.07	162.70	160.91	1.79	90.656		
												CC, ES, SF		



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #123H
Project:	San Juan County, NM	TVD Reference:	rig @ 6644.00ft
Reference Site:	Allison Unit #123H	MD Reference:	rig @ 6644.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #123H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Horz 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #123H Offsets - Allison Unit #026 - Allison #026 - Allison #026													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+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	-42.72	50.23	-46.38	68.37					
100.00	100.00	100.09	100.08	0.18	0.18	-42.82	50.10	-46.43	68.31	67.95	0.36	189.587		
200.00	200.00	200.13	200.13	0.60	0.48	-42.93	49.90	-46.41	68.15	67.07	1.08	63.333		
292.93	292.93	292.93	292.93	1.00	0.73	-42.89	49.87	-46.32	68.06	66.33	1.73	39.439		
300.00	300.00	300.00	300.00	1.03	0.75	-42.88	49.87	-46.31	68.06	66.28	1.78	38.340		
400.00	400.00	400.01	400.01	1.45	1.06	-42.81	49.93	-46.25	68.06	65.55	2.51	27.124		
500.00	500.00	500.02	500.02	1.87	1.42	-42.91	49.83	-46.32	68.04	64.75	3.29	20.697		
600.00	600.00	600.21	600.21	2.30	1.79	-43.25	49.44	-46.50	67.87	63.79	4.08	16.624		
700.00	700.00	700.38	700.38	2.72	2.11	-43.57	48.85	-46.48	67.43	62.61	4.82	13.999		
800.00	800.00	800.41	800.41	3.14	2.43	-43.94	48.13	-46.38	66.85	61.29	5.56	12.025		
900.00	900.00	900.47	900.46	3.56	2.76	-44.30	47.37	-46.23	66.19	59.88	6.31	10.488		
1,000.00	1,000.00	1,000.43	1,000.42	3.99	3.11	-44.67	46.60	-46.06	65.52	58.45	7.08	9.258		
1,100.00	1,100.00	1,100.25	1,100.23	4.41	3.49	-45.13	45.88	-46.09	65.03	57.14	7.89	8.241		
1,200.00	1,200.00	1,200.35	1,200.34	4.83	3.85	-45.43	45.33	-46.01	64.59	55.92	8.67	7.448		
1,300.00	1,300.00	1,300.08	1,300.06	5.26	4.21	-45.60	44.97	-45.93	64.28	54.83	9.45	6.800		
1,400.00	1,400.00	1,400.07	1,400.05	5.68	4.59	-45.77	44.78	-46.00	64.19	53.93	10.26	6.255		
1,500.00	1,500.00	1,500.14	1,500.13	6.10	4.83	-45.78	44.68	-45.91	64.06	53.13	10.93	5.860		
1,600.00	1,600.00	1,600.00	1,599.98	6.53	5.02	-45.62	44.72	-45.70	63.94	52.40	11.54	5.542		
1,609.33	1,609.33	1,609.35	1,609.33	6.57	5.04	-45.61	44.73	-45.69	63.94	52.33	11.61	5.509 CC		
1,700.00	1,700.00	1,699.78	1,699.76	6.95	5.32	-45.40	45.02	-45.64	64.11	51.85	12.26	5.229		
1,800.00	1,800.00	1,799.69	1,799.67	7.37	5.65	-45.13	45.54	-45.75	64.55	51.53	13.02	4.958 ES		
1,900.00	1,900.00	1,899.52	1,899.50	7.79	5.88	-124.51	45.94	-46.25	65.20	51.53	13.66	4.772 SF		
2,000.00	1,999.91	1,999.30	1,999.28	7.82	6.05	-127.33	46.30	-47.07	68.29	54.43	13.86	4.927		
2,100.00	2,099.30	2,098.38	2,098.34	7.88	6.24	-133.72	46.79	-48.06	76.42	62.31	14.12	5.413		
2,200.00	2,197.70	2,196.67	2,196.62	7.99	6.44	-141.68	47.11	-49.27	90.86	76.45	14.41	6.304		
2,300.00	2,294.63	2,293.41	2,293.37	8.18	6.64	-149.25	47.08	-50.49	112.44	97.69	14.75	7.624		
2,400.00	2,389.62	2,388.56	2,388.50	8.48	6.88	-155.52	46.66	-51.55	141.36	126.21	15.15	9.331		
2,500.00	2,482.19	2,481.10	2,481.04	8.94	7.15	-160.35	45.89	-52.35	177.41	161.80	15.61	11.362		

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



Anticollision Report



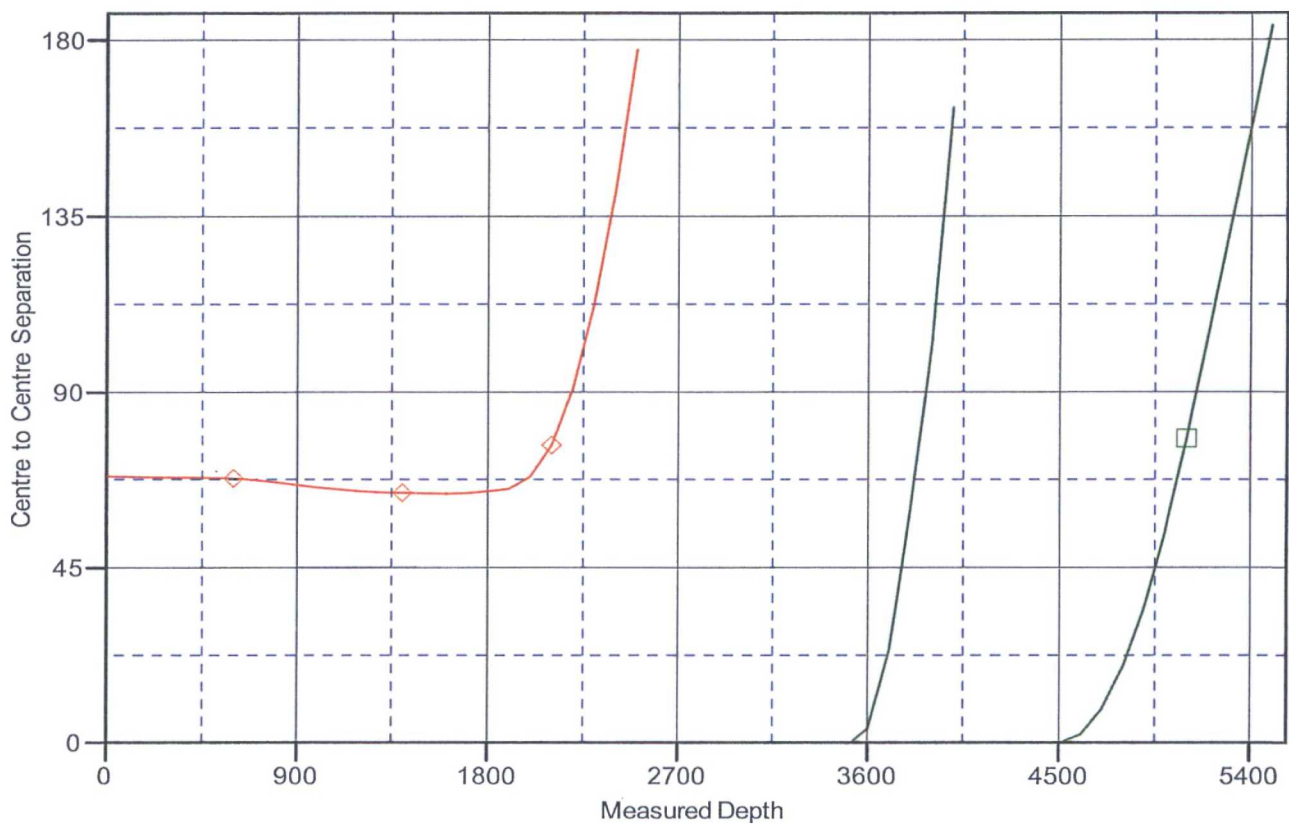
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horz 2
Reference Design: Design #3

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to rig @ 6644.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #123H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.16°

Ladder Plot



LEGEND

— Allison Unit #123H, Pilot, Design #1 V0

— Allison Unit #123H, Horz, Design #1 V0

— Allison Unit #026, Allison #026, Allison #026 V0

Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #123H
Site Error: 0.00 ft
Reference Well: Allison Unit #123H
Well Error: 0.00 ft
Reference Wellbore: Horiz 2
Reference Design: Design #3

Local Co-ordinate Reference: Well Allison Unit #123H
TVD Reference: rig @ 6644.00ft
MD Reference: rig @ 6644.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to rig @ 6644.00ft

Offset Depths are relative to Offset Datum

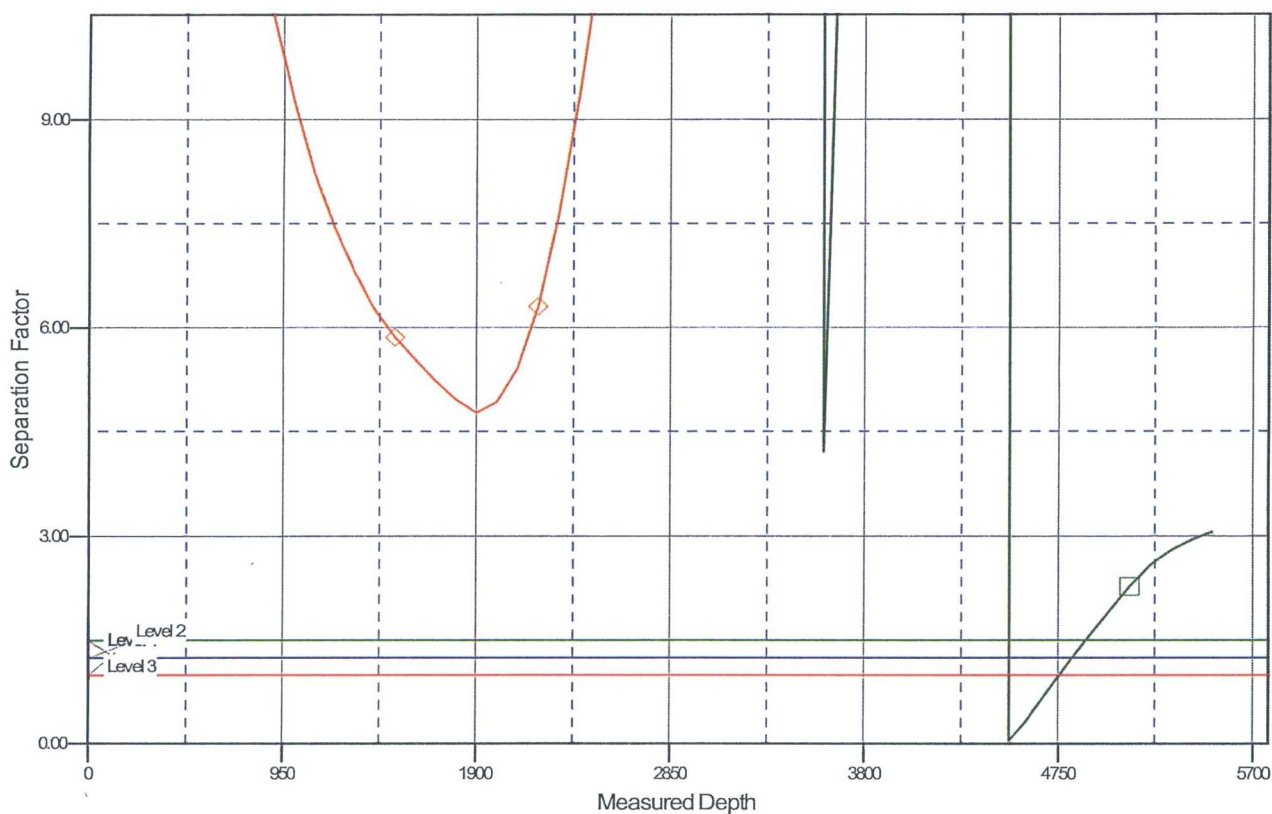
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #123H

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

Grid Convergence at Surface is: 0.16°

Separation Factor Plot



LEGEND

— Allison Unit #123H, Pilot, Design #1 V0

— Allison Unit #123H, Horiz, Design #1 V0

— Allison Unit #026, Allison #026, Allison #026 V0