

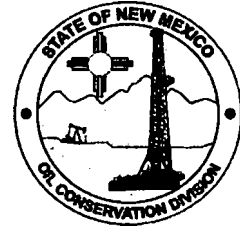
State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-5 form.
Operator Signature Date: Original APD 4/1/1996 Sundry Date 3/21/2018

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E
30-045-29363-00-00	ALLISON UNIT	145	HILCORP ENERGY COMPANY	G	A	San Juan	F	M	7	32	N	6	W

Conditions of Approval:

(See the below checked and handwritten conditions)

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

- ✓ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.
- ✓ Comply with current regulations at time of spud
Prior to production operator needs to be in compliance with RULE 19.15.5.9
- ✓ Notify Aztec OCD 24hrs prior to casing & cement.
- ✓ Notify the OCD Engineering Bureau of the change in setbacks to see if an amended NSL will be necessary prior to C-104 approval.
- ✓ Adhere to any other previously issued conditions.



NMOCD Approved by Signature

5/25/18
Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

MAR 21 2013

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 M (SW/SW) 880' FSL & 925' FWL, Sec. 07, T32N, R06W
Bottomhole (Lat 1) Unit B (NW/NE) 197' FNL & 1777' FEL, Sec. 13, T32N, R07W
Bottomhole (ST 1) Unit H (SE/NE) 1727' FNL & 931' FEL, Sec. 13, T32N, R07W
Bottomhole (Lat 2) Unit A (NE/NE) 504' FNL & 1208' FEL, Sec. 18, T32N, R07W
Bottomhole (ST 2) Unit G (SW/NE) 2004' FNL & 2491' FEL, Sec. 18, T32N, R06W
Bottomhole (Lat 3) Unit G (SW/NE) 1419' FNL & 2132' FWL, Sec. 07, T32N, R06W

5. Lease Serial No.

NM-04207 / FEE

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 145H

9. API Well No.

30-045-29363

10. Field and Pool or Exploratory Area

Basin Fuitland Coal

11. Country or Parish, State

San Juan New Mexico
NMOCB

APR 10 2018

DISTRICT III

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

TYPE OF SUBMISSION

☒ Notice of Intent

☐ Subsequent Report

☐ Final Abandonment Notice

TYPE OF ACTION

☐ Acidize

☐ Alter Casing

☐ Casing Repair

☐ Change Plans

☐ Convert to Injection

☐ Deepen

☐ Fracture Treat

☐ New Construction

☐ Plug and Abandon

☐ Plug Back

☐ Production (Start/Resume)

☐ Reclamation

☐ Recomplete

☐ Temporarily Abandon

☐ Water Disposal

☐ Water Shut-Off

☐ Well Integrity

☒ Other Revised

C-102's &

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 recompleat 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 recompleat 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 utilize the existing wellbore, Allison Unit Com 145 and conduct 3 casing exits, with 2 additional open hole sidetracks added to the first 2 laterals. The original wellbore will be P&A'd and isolated with a CIBP @ 2900'. Window depths are as follows: Lat 1 - 2726' MD, Lat 2 - 2686' MD, Lat 3 - 2646' MD. 4-1/2" liners will be run inside each lateral and dropped off just outside the window. Open hole sidetracks will be conducted at 3400' MD in Lat 1 and 3500' MD in Lat 2. All whipstocks will be recovered. The 4-1/2" liners will be run outside the windows, and not tied back into the pilot hole to allow production tubing to be run in the sump of the existing 7" casing. This allows produced water to be evacuated from the production casing.

The revised C-102's and drilling plans are attached.

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

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

Amanda Ray

Title Operations/Regulatory Technician - Sr.

Signature

Date

3/21/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title PE

Date

4/9/18

Office FFG

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.

(Instruction on page 2)

NMOCB

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

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6176 Fax: (505) 334-6170

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

State of New Mexico
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 30-045-29363	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL 2
⁴ Property Code 318864	⁵ Property Name ALLISON UNIT	⁶ Well Number NMOCD 145 H
⁷ OGRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6519'

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
M	7	32-N	6-W	7	880	SOUTH	925	WEST	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
A	18	32-N	6-W		504	NORTH	1208	EAST	SAN JUAN

¹² Dedicated Acres PROJECT AREA: 1,707.11 ACRES SEE DETAIL BELOW	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-8768-C
--	-------------------------------	----------------------------------	--

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 DETAIL:

SEC. 12 T32N-R7W - LOTS 1-2, SE/4 = 199.55 ACRES
SEC. 13 T32N-R7W - E/2 = 320.00 ACRES
SEC. 7 T32N-R6W - LOTS 1-7, E/2 SW/4, SE/4 NW/4, S/2 NE/4, SE/4 = 549.74 ACRES
SEC. 18 T32N-R6W - LOTS 1-4, E/2 W/2, E/2 = 637.82 ACRES

SURFACE

LATITUDE: 36°59.3992' N
LONGITUDE: 107°30.3216' W
NAD27

LATITUDE: 36.989992° N
LONGITUDE: 107.505966° W
NAD83

FIRST TAKE

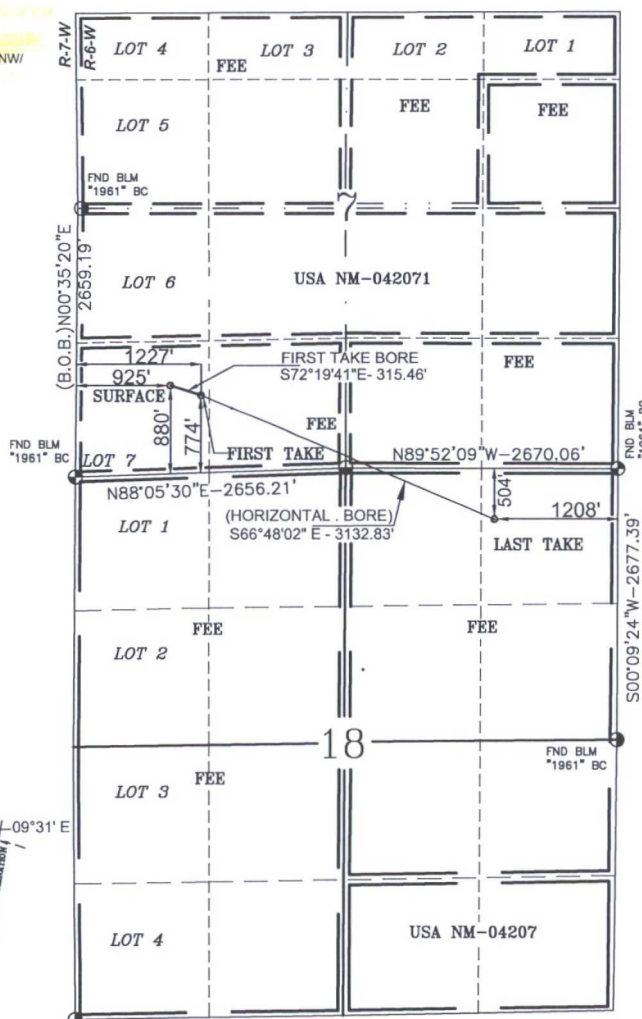
774' FSL 1227' FWL SEC. 7
LATITUDE: 36°59.3834' N
LONGITUDE: 107°30.2599' W
NAD27

LATITUDE: 36.989729° N
LONGITUDE: 107.504937° W
NAD83

LAST TAKE

LATITUDE: 36°59.1800' N
LONGITUDE: 107°29.6686' W
NAD27

LATITUDE: 36.986338° N
LONGITUDE: 107.495083° W
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 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.

Amanda Ray 4/17/18
Signature Date

Amanda Ray

Printed Name

mray@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.

MARCH 10, 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

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-8170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3480 Fax: (505) 476-3482

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 30-045-29363	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL 2 SIDETRACK 1
⁴ Property Code 318864	⁵ Property Name ALLISON UNIT	⁶ Well Number 145 H
⁷ OGRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6519'

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
M	7	32-N	6-W	7	880	SOUTH	925	WEST	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
G	18	32-N	6-W		2004	NORTH	2491	EAST	SAN JUAN

¹² Dedicated Acres PROJECT AREA 1,707.11 ACRES SEE DETAIL BELOW	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-8768-C
--	-------------------------------	----------------------------------	--

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 DETAIL:

SEC. 12 T32N-R7W - LOTS 1-2, SE/4 = 199.55 ACRES
SEC. 13 T32N-R7W - E/2 = 320.00 ACRES
SEC. 7 T32N-R6W - LOTS 1-7, E/2 SW/4, SE/4 NW/4, S/2 NE/4, SE/4 = 549.74 ACRES
SEC. 18 T32N-R6W - LOTS 1-4, E/2 W/2, E/2 = 637.82 ACRES

SURFACE

LATITUDE: 36°59.3992' N
LONGITUDE: 107°30.3216' W
NAD27

LATITUDE: 36.989992° N
LONGITUDE: 107.505966° W
NAD83

FIRST TAKE

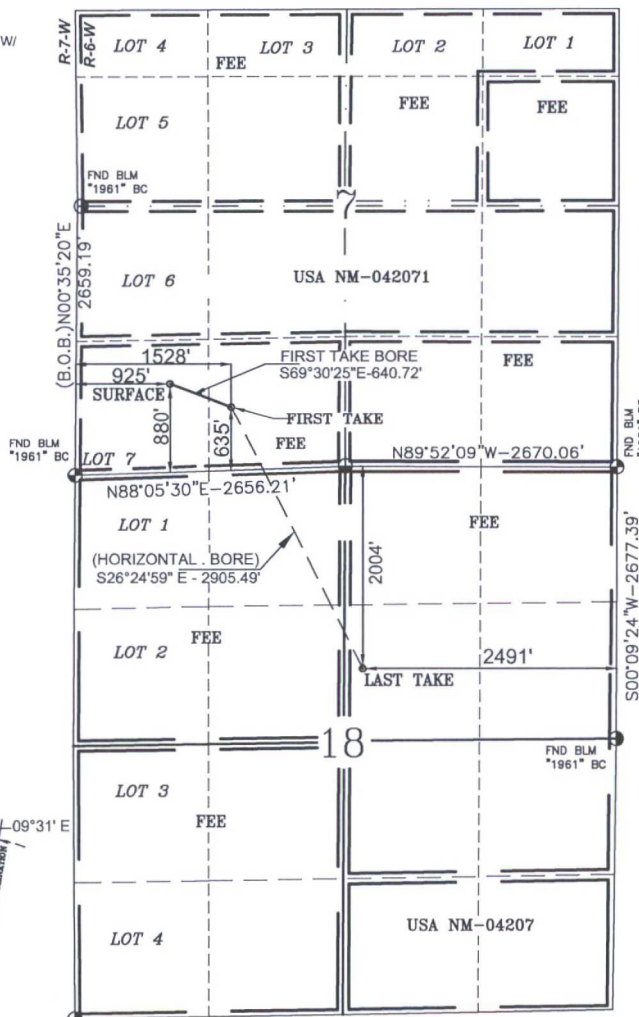
635' FSL 1528' FWL SEC. 7
LATITUDE: 36°59.3622' N
LONGITUDE: 107°30.1983' W
NAD27

LATITUDE: 36.989376° N
LONGITUDE: 107.503912° W
NAD83

LAST TAKE

LATITUDE: 36°58.9335' N
LONGITUDE: 107°29.9331' W
NAD27

LATITUDE: 36.982230° N
LONGITUDE: 107.499491° W
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 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.

Amanda Ray 4/17/18
Signature Date
Amanda Ray

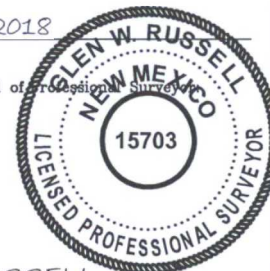
Printed Name
mray@hilcorp.com
E-mail Address

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.

MARCH 11, 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

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
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Phone: (505) 334-6178 Fax: (505) 334-6170

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 30-045-29363	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL 1
⁴ Property Code 318864	⁵ Property Name ALLISON UNIT	⁶ Well Number 145 H
⁷ OGRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6519'

¹⁰ Surface Location

DISTRICT III

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	7	32-N	6-W	7	880	SOUTH	925	WEST	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
B	13	32-N	7-W		197	NORTH	1777	EAST	SAN JUAN

¹² Dedicated Acres PROJECT AREA 1,707.11 ACRES SEE DETAIL BELOW	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-8768-C
--	-------------------------------	----------------------------------	--

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OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

¹⁶ DETAIL:

SEC. 12 T32N-R7W - LOTS 1-2, SE/4 = 199.55 ACRES
SEC. 13 T32N-R7W - E/2 = 320.00 ACRES
SEC. 7 T32N-R6W - LOTS 1-7, E/2 SW/4, SE/4 NW/4, S/2 NE/4, SE/4 = 549.74 ACRES
SEC. 18 T32N-R6W - LOTS 1-4, E/2 W/2, E/2 = 637.82 ACRES

SURFACE

LATITUDE: 36°59.3992' N
LONGITUDE: 107°30.3216' W
NAD27

LATITUDE: 36.989992° N
LONGITUDE: 107.505966° W
NAD83

FIRST TAKE

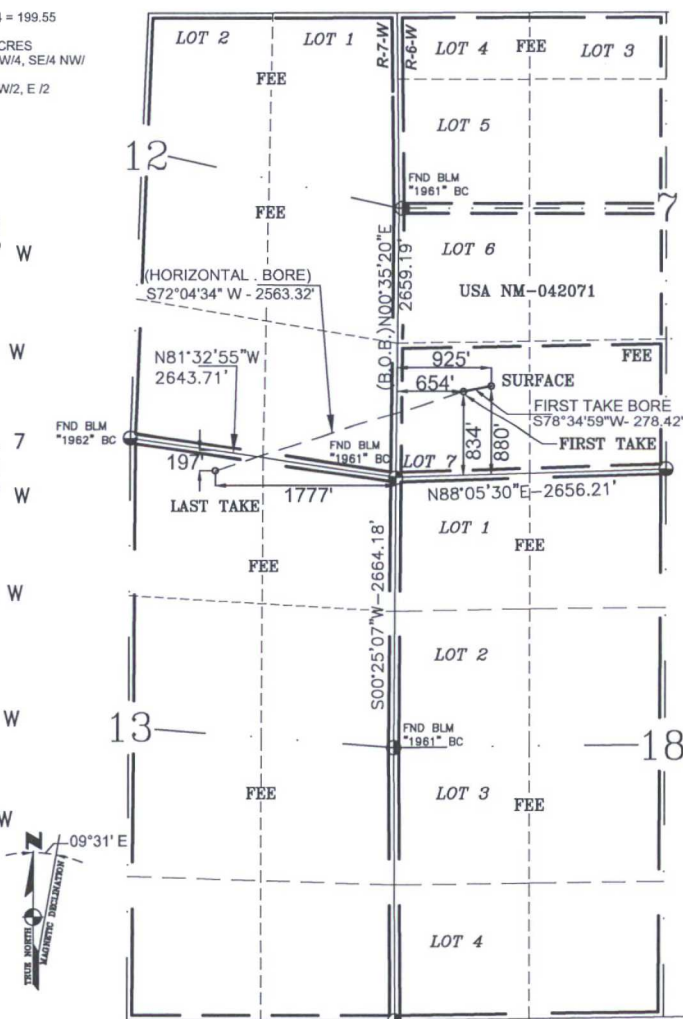
834' FSL 654' FWL SEC. 7
LATITUDE: 36°59.3901' N
LONGITUDE: 107°30.3776' W
NAD27

LATITUDE: 36.989841° N
LONGITUDE: 107.506900° W
NAD83

LAST TAKE

LATITUDE: 36°59.2603' N
LONGITUDE: 107°30.8785' W
NAD27

LATITUDE: 36.987676° N
LONGITUDE: 107.515248° W
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 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.

Amanda Ray 04/17/18
Signature Date
Amanda Ray
Printed Name
mray@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.

MARCH 9, 2018
Date of Survey
Signature and Seal of Professional Surveyor
GLEN W. RUSSELL
Certificate Number
15703



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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 30-045-29363		² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL 1 SIDETRACK 1
⁴ Property Code 318864	⁵ Property Name ALLISON UNIT		⁶ Well Number NMOCD 145 H
⁷ OGRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY		⁹ Elevation 6519'

¹⁰ Surface Location

DISTRICT III

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	7	32-N	6-W	7	880	SOUTH	925	WEST	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
H	13	32-N	7-W		1727	NORTH	931	EAST	SAN JUAN

¹² Dedicated Acres PROJECT AREA 1,707.11 ACRES SEE DETAIL BELOW	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-8768-C
--	-------------------------------	----------------------------------	--

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 DETAIL:

SEC. 12 T32N-R7W - LOTS 1-2, SE/4 = 199.55 ACRES
SEC. 13 T32N-R7W - E/2 = 320.00 ACRES
SEC. 7 T32N-R6W - LOTS 1-7, E/2 SW/4, SE/4 NW/4, S/2 NE/4, SE/4 = 549.74 ACRES
SEC. 18 T32N-R6W - LOTS 1-4, E/2 W/2, E/2 = 637.82 ACRES

SURFACE

LATITUDE: 36°59.3992' N
LONGITUDE: 107°30.3216' W
NAD27

LATITUDE: 36.989992° N
LONGITUDE: 107.505966° W
NAD83

FIRST TAKE

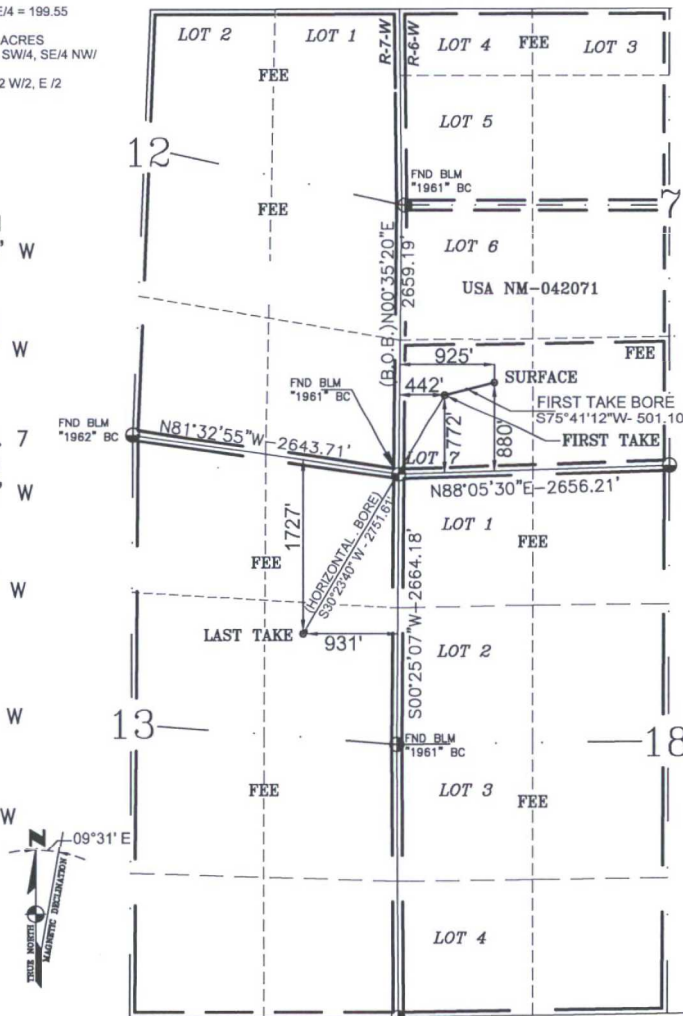
772' FSL 442' FWL SEC. 7
LATITUDE: 36°59.3788' N
LONGITUDE: 107°30.4213' W
NAD27

LATITUDE: 36.989652° N
LONGITUDE: 107.507628° W
NAD83

LAST TAKE

LATITUDE: 36°58.9879' N
LONGITUDE: 107°30.7073' W
NAD27

LATITUDE: 36.983136° N
LONGITUDE: 107.512395° W
NAD83



¹⁷ OPERATOR CERTIFICATION

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Amanda Ray 4/17/18
Signature Date
Amanda Ray
Printed Name
mray@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.

MARCH 12, 2018
Date of Survey
Signature and Seal of Professional Surveyor
GLEN W. RUSSELL
Certificate Number 15703



☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-29363	² Pool Code 71629	³ Pool Name BASIN FRUITLAND COAL LATERAL 3
⁴ Property Code 318864	⁵ Property Name ALLISON UNIT	⁶ Well Number 145 H
⁷ OGRID No. 372171	⁸ Operator Name HILCORP ENERGY COMPANY	⁹ Elevation 6519'

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
M	7	32-N	6-W	7	880	SOUTH	925	WEST	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
G	7	32-N	6-W		1419	NORTH	2132	WEST	SAN JUAN

¹² Dedicated Acres PROJECT AREA: 1,707.11 ACRES See Detail Below	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-8768-C
---	-------------------------------	----------------------------------	---

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

FND BLM
"1961" BC

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

Amanda Ray

Signature _____

Amanda Ray

Printed Name _____

mray@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.

MARCH 8, 2018

Date of Survey

Signature and Seal

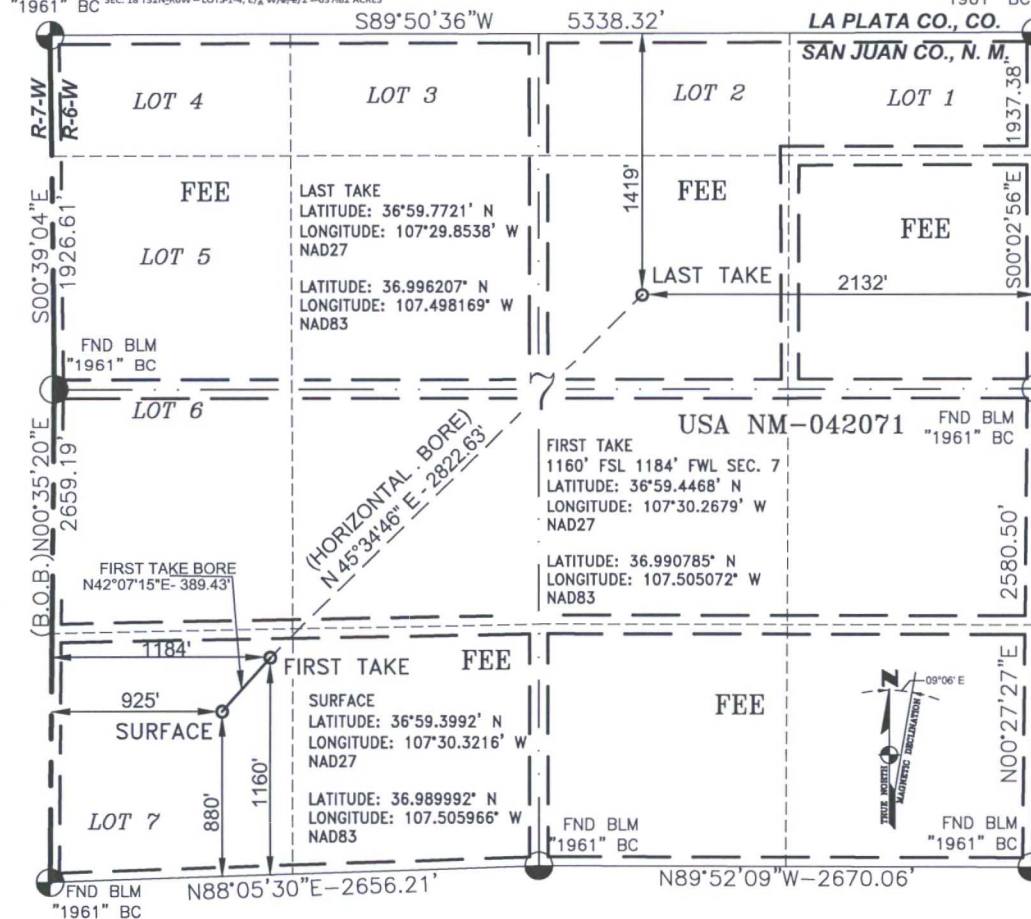
Professional Surveyor



GLEN W. RUSSELL

Certificate Number

15703



ALLISON UNIT 145H
(3004529363)

PROJECT AREA:
1,707.11 ACRES

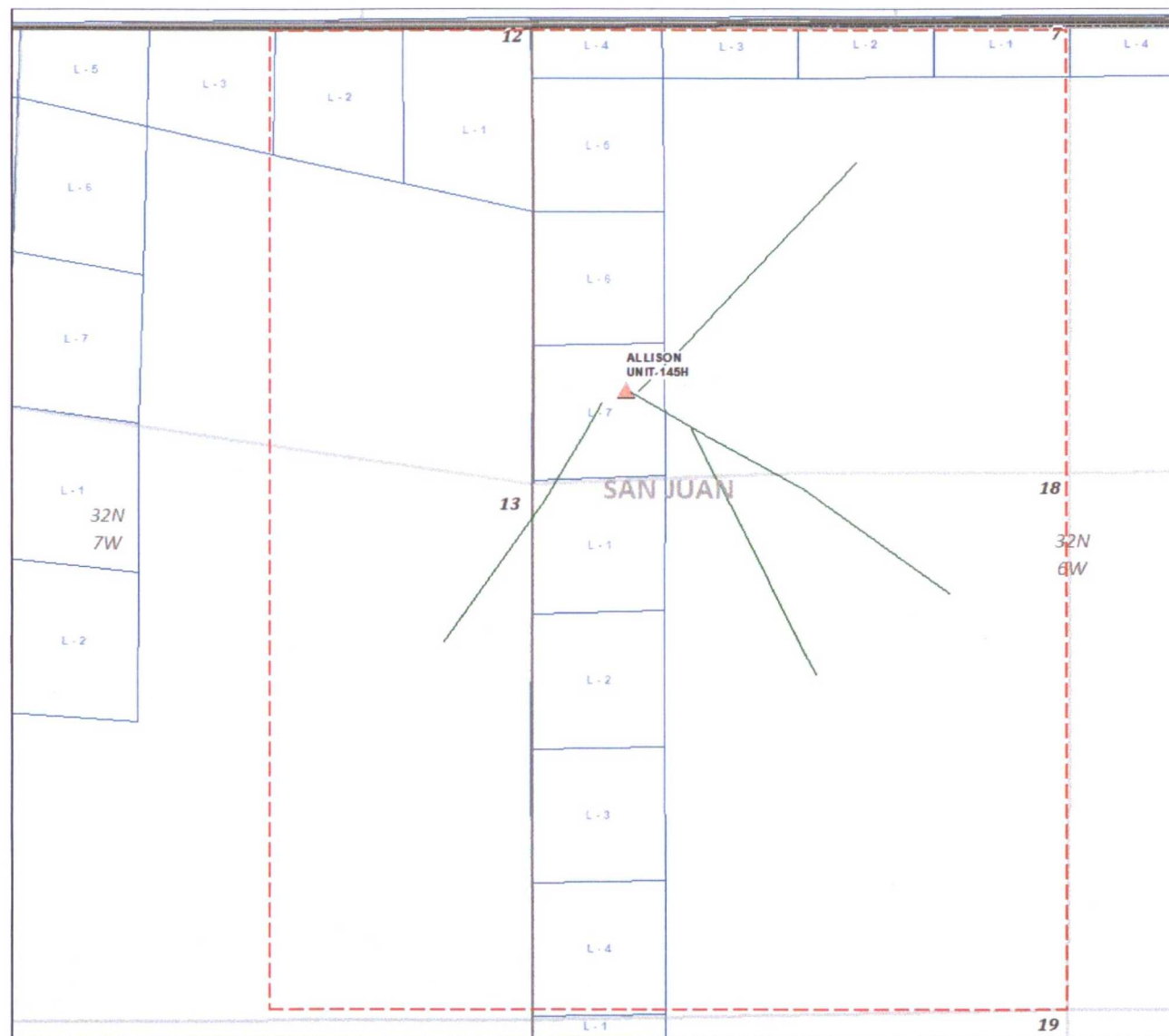
SEC. 12 T32N-R7W –
LOTS 1-2, SE/4 =
199.55 ACRES

SEC. 13 T32N-R7W –
E/2 = 320.00 ACRES

SEC. 7 T32N-R6W –
LOTS 1-7, E/2 SW/4,
SE/4 NW/4, S/2 NE/4,
SE/4 = 549.74 ACRES

SEC. 18 T32N-R6W –
LOTS 1-4, E/2 W/2,
E/2 = 637.82 ACRES

*BOUNDARY DEPICTED
IN RED DASHED LINE.
LATERAL ORIENTATION
NOT EXACT. FOR
REFERENCE ONLY.



Allison Unit COM #145H

Hilcorp Energy Company proposes to drill and complete the referenced multiple horizontal well targeting a coal seam with in the Fruitland formation. The plan is to utilize the existing wellbore, Allison Unit COM #145, and conduct 3 casing exits, with 2 additional open hole sidetracks added to the first 2 laterals.

1. Location

Allison Unit COM #152H

SHL: 880' FSL, 925' FWL – T32N, R06W, Sec 7 (San Juan County)

BHL (Lat1): 197' FNL, 1777' FEL – T 32N, R07W, Sec 13 (San Juan County)

BHL (Lat1 ST): 1727' FNL, 931' FEL – T 32N, R07W, Sec 13 (San Juan County)

BHL (Lat2): 504' FNL, 1208' FEL – T 32N, R06W, Sec 18 (San Juan County)

BHL (Lat2 ST): 2004' FNL, 2491' FEL – T32N, R06W, Sec 18 (San Juan County)

BHL (Lat3): 1419' FNL, 2132' FWL – T 32N, R06W, Sec 7 (San Juan County)

GL: 6,519'

2. Geological Markers

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

Formation	Depth (TVD)	Remarks
Nacimiento	976'	
Ojo Alamo	2,147'	
Kirtland	2,361'	
Fruitland	2,894'	Gas
Pargin Seam	3,011'	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 prior to commencement of any well work.
- 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 (existing)	12-1/4"	9-5/8"	36#, K-55, STC	155' MD/TVD
Intermediate (existing)	8-3/4"	7"	20#, K-55, STC	2,955' MD/TVD
Lat 1 - Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	5738' MD / 3024' TVD
Lat 1ST - Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	6202' MD / 3019' TVD
Lat 2 - Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	6330' MD / 3019' TVD
Lat 2ST - Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	6487' MD / 3034' TVD
Lat 3 - Production Liner (Pre-Perforated)	6-1/4"	4-1/2"	11.6# J-55/L-80	6043' MD / 3004' TVD

The existing wellbore will be temporarily isolated with a RBP @ 2900'. The RBP will be recovered after drilling the laterals. Window depths are as follows:

Lat 1 – 2726' MD/ TVD - Lat 1 open hole ST – 3400' MD / 3014' TVD

Lat 2 – 2686' MD/TVD – Lat 2 open hole ST – 3500' MD / 3013' TVD

Lat 3 – 2646' MD/TVD

4-1/2" liners will be run inside each lateral and dropped off just outside the window.

Open hole sidetracks will be conducted at 3400' MD in Lat 1, and at 3500' MD in lat 2.

All whipstocks will be recovered. The 4-1/2" liners will be run outside the windows, and not tied back into the pilot hole to allow production tubing to be run in the sump of the existing 7" casing. 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.

b. There are no planned cmt jobs during the drilling of this well. Kick off plugs may be necessary if desired build rates are not achieved.

c. There are no centralizers being run on the 4-1/2" liner.

5. Drilling Fluids

a. The proposed drilling fluid program is outlined below:

Mud Program			
Interval	Mud Type	Weight (ppg)	Fluid Loss (cc)
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. When brine is not utilized and cuttings pass tests for TCLP Metals (RCRCA 8) and TCLP Benzene, they will be hauled to the Bondad landfill.

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	None planned	
Temp Survey	None planned	

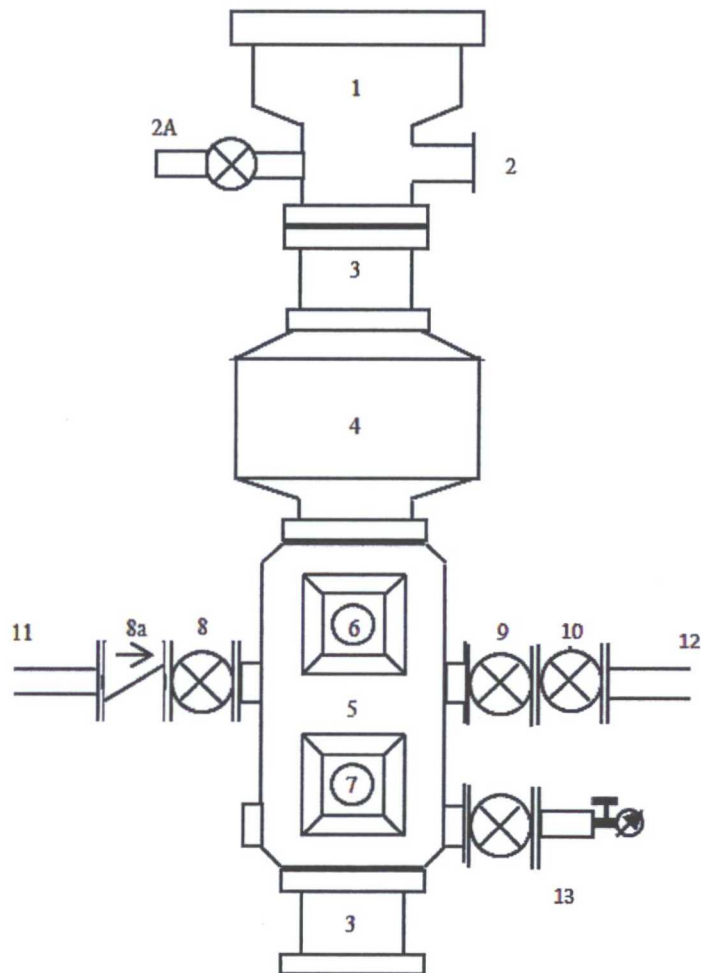
8. Directional Plan

The planned wellbore directional plans and plots are attached

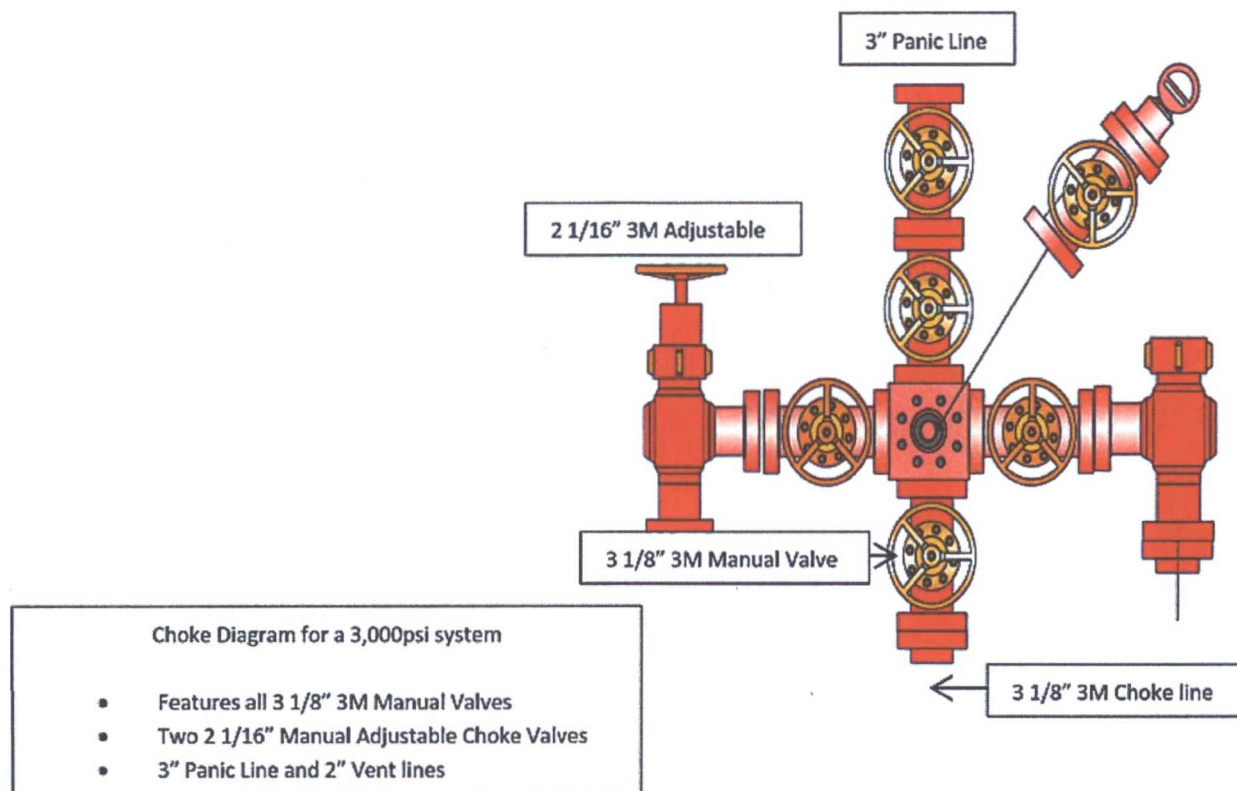
The planned directional plans are built using geological targets from offset wells. The production hole will be landed and drilled within target formation horizontally utilizing LWD equipment to help steer the wellbore. On site adjustments will be made to the directional plan as formation and hole indicates.

BOPE Schematic – Aztec 777

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



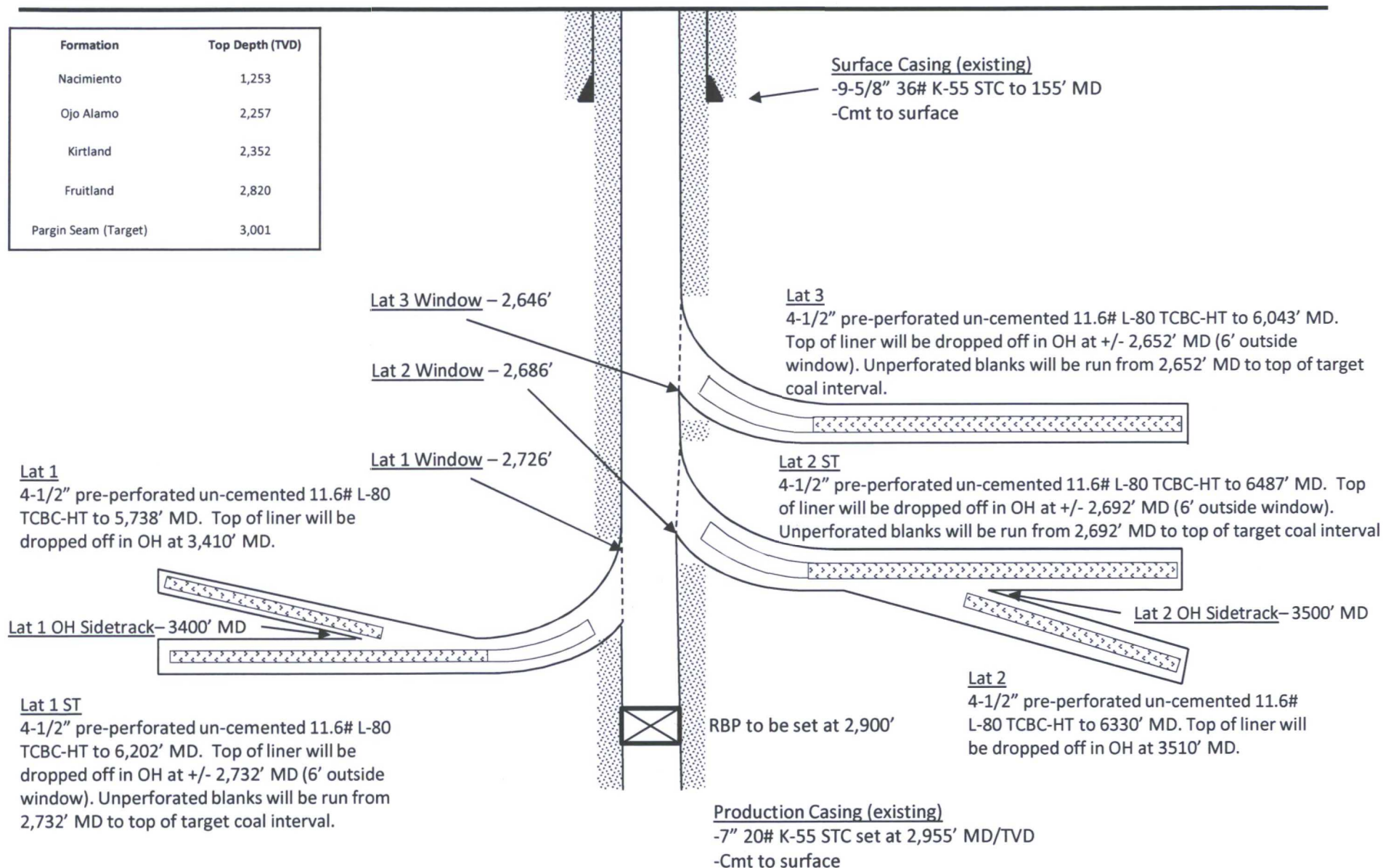
Choke Manifold Schematic – Aztec 777





Allison Unit #145H ST Planned Well Schematic

Formation	Top Depth (TVD)
Nacimiento	1,253
Ojo Alamo	2,257
Kirtland	2,352
Fruitland	2,820
Pargin Seam (Target)	3,001





HILCORP ENERGY COMPANY
ALLISON UNIT #145 Lat 1
SAN JUAN BASIN NM
6519' GL + 15' KB



WELL DETAILS: Allison Unit #145H

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.00	0.00	2179789.300	6519.00	595785.900	36° 59' 23.953 N	107° 30' 19.296 W

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

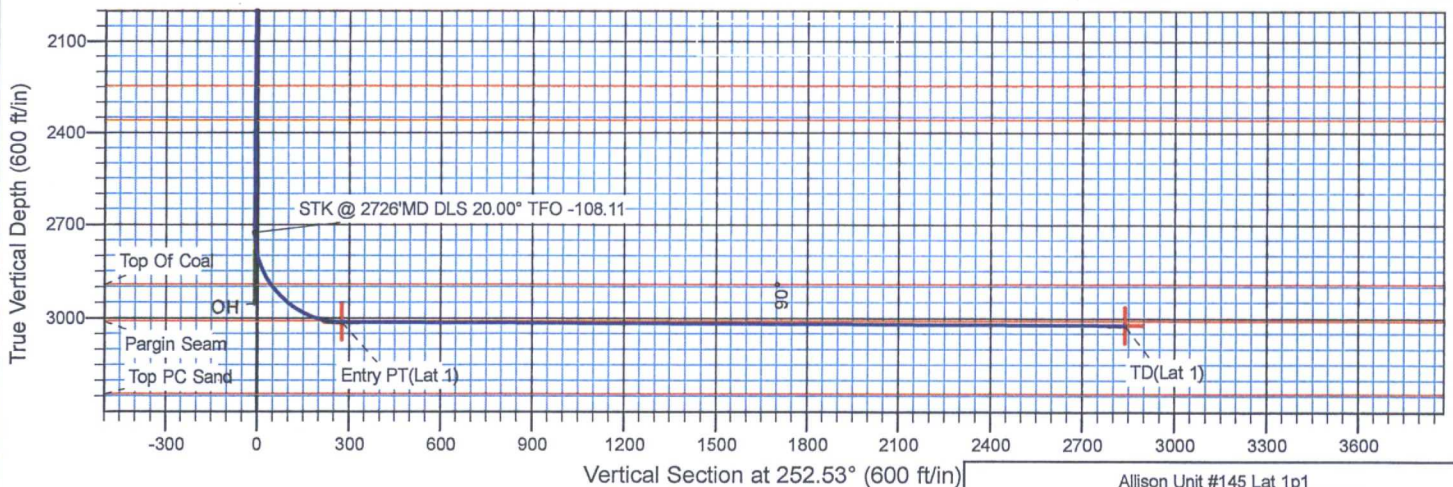
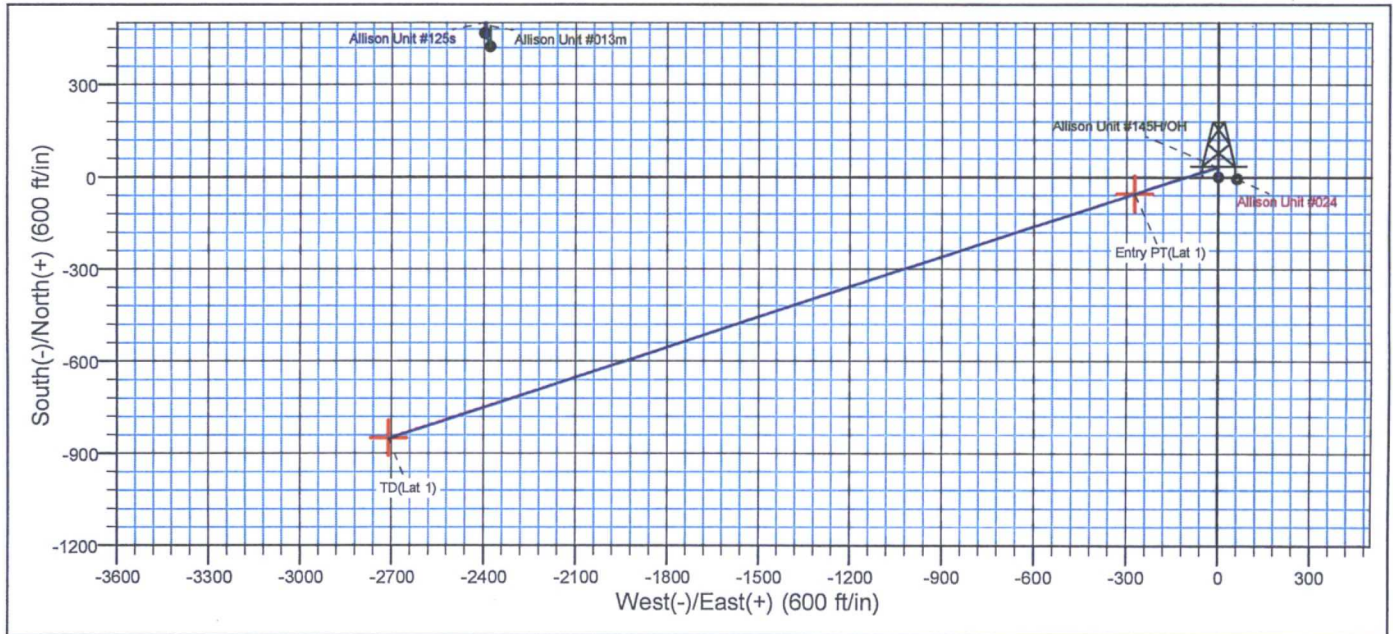
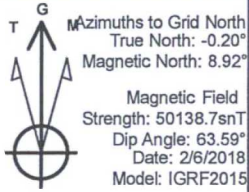
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	2726.36	0.88	0.00	2726.18	28.67	0.00	0.00	0.00	-8.61	
2	3176.61	89.78	251.89	3014.00	-56.02	-272.53	20.00	-108.11	276.78	
3	5738.88	89.78	251.89	3024.00	-852.30	-2707.91	0.00	0.00	2838.87	TD(Lat 1)

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Entry PT(Lat 1)	3014.00	-56.02	-272.53	2179733.280	595513.371	36° 59' 23.409 N	107° 30' 22.658 W	Point
TD(Lat 1)	3024.00	-852.30	-2707.91	2178937.000	593078.000	36° 59' 15.616 N	107° 30' 52.710 W	Point



Allison Unit #145 Lat 1p1

Created By: Frank Scardino Date: 2/7/2018
 Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 1

Plan: Design #1

Standard Planning Report

07 February, 2018





Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 1		
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 #145H				
Site Position:		Northing:	2,179,789.300 usft	Latitude:	36° 59' 23.953 N
From:	Map	Easting:	595,785.900 usft	Longitude:	107° 30' 19.296 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.20 °

Well	Allison Unit #145H					
Well Position	+N/-S	0.00 ft	Northing:	2,179,789.300 usft	Latitude:	36° 59' 23.953 N
	+E/-W	0.00 ft	Easting:	595,785.900 usft	Longitude:	107° 30' 19.296 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	6,519.00 ft

Wellbore	Lat 1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/6/2018	9.12	63.59	50,139

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	2,726.36
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	252.53

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
2,726.36	0.88	0.00	2,726.18	28.67	0.00	0.00	0.00	0.00	0.00	
3,176.61	89.78	251.89	3,014.00	-56.02	-272.53	20.00	19.74	-24.01	-108.11	
5,738.88	89.78	251.89	3,024.00	-852.30	-2,707.91	0.00	0.00	0.00	0.00	TD(Lat 1)



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 1		
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)
2,726.36	0.88	0.00	2,726.18	28.67	0.00	-8.61	0.05	0.05	0.00
STK @ 2726°MD DLS 20.00° TFO -108.11									
2,750.00	4.53	262.53	2,749.80	28.73	-0.93	-7.74	20.00	15.44	-412.31
2,775.00	9.49	256.91	2,774.60	28.14	-3.92	-4.71	20.00	19.83	-22.47
2,800.00	14.48	255.14	2,799.05	26.87	-8.95	0.47	20.00	19.95	-7.09
2,825.00	19.47	254.26	2,822.95	24.94	-15.98	7.76	20.00	19.97	-3.51
2,850.00	24.47	253.73	2,846.13	22.36	-24.97	17.10	20.00	19.98	-2.12
2,875.00	29.46	253.38	2,868.41	19.14	-35.84	28.44	20.00	19.99	-1.43
2,900.00	34.46	253.11	2,889.61	15.33	-48.50	41.66	20.00	19.99	-1.05
2,905.36	35.53	253.06	2,894.00	14.43	-51.45	44.74	20.00	19.99	-0.89
Top Of Coal									
2,925.00	39.46	252.91	2,909.58	10.94	-62.88	56.69	20.00	19.99	-0.79
2,950.00	44.46	252.75	2,928.16	6.00	-78.84	73.40	20.00	20.00	-0.66
2,975.00	49.46	252.61	2,945.22	0.56	-96.28	91.67	20.00	20.00	-0.55
3,000.00	54.46	252.49	2,960.62	-5.34	-115.05	111.35	20.00	20.00	-0.47
3,025.00	59.46	252.39	2,974.25	-11.66	-135.03	132.30	20.00	20.00	-0.42
3,050.00	64.46	252.29	2,986.00	-18.36	-156.05	154.36	20.00	20.00	-0.38
3,075.00	69.46	252.21	2,995.78	-25.37	-177.95	177.36	20.00	20.00	-0.35
3,100.00	74.46	252.12	3,003.52	-32.65	-200.57	201.12	20.00	20.00	-0.32
3,125.00	79.45	252.05	3,009.16	-40.14	-223.74	225.46	20.00	20.00	-0.31
3,136.22	81.70	252.01	3,011.00	-43.55	-234.26	236.53	20.00	20.00	-0.30
Pargin Seam									
3,150.00	84.45	251.97	3,012.66	-47.78	-247.27	250.21	20.00	20.00	-0.30
3,176.61	89.78	251.89	3,014.00	-56.02	-272.53	276.78	20.00	20.00	-0.29
Entry PT(Lat 1)									
3,200.00	89.78	251.89	3,014.09	-63.29	-294.76	300.16	0.00	0.00	0.00
3,300.00	89.78	251.89	3,014.48	-94.37	-389.81	400.16	0.00	0.00	0.00
3,400.00	89.78	251.89	3,014.87	-125.44	-484.86	500.15	0.00	0.00	0.00
3,500.00	89.78	251.89	3,015.26	-156.52	-579.90	600.14	0.00	0.00	0.00
3,600.00	89.78	251.89	3,015.65	-187.60	-674.95	700.14	0.00	0.00	0.00
3,700.00	89.78	251.89	3,016.04	-218.67	-770.00	800.13	0.00	0.00	0.00
3,800.00	89.78	251.89	3,016.43	-249.75	-865.05	900.12	0.00	0.00	0.00
3,900.00	89.78	251.89	3,016.82	-280.83	-960.09	1,000.12	0.00	0.00	0.00
4,000.00	89.78	251.89	3,017.21	-311.91	-1,055.14	1,100.11	0.00	0.00	0.00
4,100.00	89.78	251.89	3,017.60	-342.98	-1,150.19	1,200.10	0.00	0.00	0.00
4,200.00	89.78	251.89	3,017.99	-374.06	-1,245.24	1,300.09	0.00	0.00	0.00
4,300.00	89.78	251.89	3,018.38	-405.14	-1,340.28	1,400.09	0.00	0.00	0.00
4,400.00	89.78	251.89	3,018.77	-436.21	-1,435.33	1,500.08	0.00	0.00	0.00
4,500.00	89.78	251.89	3,019.16	-467.29	-1,530.38	1,600.07	0.00	0.00	0.00
4,600.00	89.78	251.89	3,019.56	-498.37	-1,625.43	1,700.07	0.00	0.00	0.00
4,700.00	89.78	251.89	3,019.95	-529.45	-1,720.48	1,800.06	0.00	0.00	0.00
4,800.00	89.78	251.89	3,020.34	-560.52	-1,815.52	1,900.05	0.00	0.00	0.00
4,900.00	89.78	251.89	3,020.73	-591.60	-1,910.57	2,000.05	0.00	0.00	0.00
5,000.00	89.78	251.89	3,021.12	-622.68	-2,005.62	2,100.04	0.00	0.00	0.00
5,100.00	89.78	251.89	3,021.51	-653.76	-2,100.67	2,200.03	0.00	0.00	0.00
5,200.00	89.78	251.89	3,021.90	-684.83	-2,195.71	2,300.03	0.00	0.00	0.00
5,300.00	89.78	251.89	3,022.29	-715.91	-2,290.76	2,400.02	0.00	0.00	0.00
5,400.00	89.78	251.89	3,022.68	-746.99	-2,385.81	2,500.01	0.00	0.00	0.00
5,500.00	89.78	251.89	3,023.07	-778.06	-2,480.86	2,600.00	0.00	0.00	0.00
5,600.00	89.78	251.89	3,023.46	-809.14	-2,575.90	2,700.00	0.00	0.00	0.00
5,700.00	89.78	251.89	3,023.85	-840.22	-2,670.95	2,799.99	0.00	0.00	0.00
5,738.88	89.78	251.89	3,024.00	-852.30	-2,707.91	2,838.87	0.00	0.00	0.00
TD(Lat 1)									



Planning Report



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 1
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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
Entry PT(Lat 1) - plan hits target center - Point	0.00	0.00	3,014.00	-56.02	-272.53	2,179,733.281	595,513.370	36° 59' 23.409 N	107° 30' 22.658 W
TD(Lat 1) - plan hits target center - Point	0.00	0.00	3,024.00	-852.30	-2,707.91	2,178,937.000	593,078.000	36° 59' 15.616 N	107° 30' 52.710 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,249.13	2,249.00	Ojo Alamo		0.00	
2,361.14	2,361.00	Kirtland		0.00	
2,905.36	2,894.00	Top Of Coal		0.00	
3,136.22	3,011.00	Pargin Seam		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,726.36	2,726.18	28.67	0.00	STK @ 2726'MD DLS 20.00° TFO -108.11



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 1

Design #1

Anticollision Report

07 February, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	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
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,266.90 ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCSWA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program		Date	2/7/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,726.36	OH (OH)	MWD	MWD - Standard	
2,726.36	5,738.82	Design #1 (Lat 1)	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 #145H						
Allison Unit #145H - OH - OH	3,100.00	2,955.00	216.42	213.43	72.376	CC, ES
Allison Unit #145H - OH - OH	3,200.00	2,955.00	315.53	310.65	64.553	SF
Allison Unit #145H Offsets						
Allison Unit #009 - Allison Unit #009 - Allison Unit #009						Out of range
Allison Unit #009m - Allison Unit #009m - Allison Unit #0						Out of range
Allison Unit #009R - Allison Unit #009R - Allison Unit #00						Out of range
Allison Unit #013m - Allison Unit #013m - Allison Unit #0	5,016.91	2,983.46	1,149.15	1,055.54	12.276	CC
Allison Unit #013m - Allison Unit #013m - Allison Unit #0	5,100.00	2,982.89	1,152.15	1,055.54	11.925	ES
Allison Unit #013m - Allison Unit #013m - Allison Unit #0	5,300.00	2,981.50	1,183.51	1,081.55	11.608	SF
Allison Unit #020m - Allison Unit #020m - Allison Unit #0						Out of range
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	0.00	0.00	61.66			
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,500.00	2,499.85	68.94	53.62	4.500	ES
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,700.00	2,699.83	70.29	53.72	4.242	SF
Allison Unit #024A - Allison Unit #024A - Allison Unit #02						Out of range
Allison Unit #039m - Allison Unit #039m - Allison Unit #0						Out of range
Allison Unit #039N - Wellbore #1 - Wellbore #1						Out of range
Allison Unit #061 - Allison Unit #061 - Allison Unit #061						Out of range
Allison Unit #061m - Allison Unit #061m - Allison Unit #0						Out of range
Allison Unit #061N - Allison Unit #061N - Allison Unit #06						Out of range
Allison Unit #112s - Allison Unit #112s - Wellbore #1						Out of range
Allison Unit #125s - Allison Unit #125s - Allison Unit #125						Out of range
Allison Unit #133s - Allison Unit #133s - Allison Unit #133						Out of range
Allison Unit #134s - Allison Unit #134s - Allison Unit #134						Out of range
Allison Unit 057N - Allison Unit #057N - Allison Unit #057						Out of range

Offset Design												
Allison Unit #145H - Allison Unit #145H - OH - OH												
Survey Program: 156-MWD												
Offset Site Error: 0.00 ft												
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
2,726.36	2,726.17	2,726.34	2,726.16	0.00	0.00	166.92	28.67	0.00	0.89			
2,800.00	2,799.05	2,799.19	2,799.00	0.33	0.30	176.50	29.82	0.00	9.42	8.82	0.60	15.736

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 156-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	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)				
2,900.00	2,889.61	2,889.54	2,889.34	0.85	0.68	178.36	31.31	0.00	51.07	49.69	1.38	37.099		
3,000.00	2,960.62	2,955.00	2,954.79	0.85	0.95	178.77	32.43	0.00	121.24	119.74	1.49	81.249		
3,100.00	3,003.52	2,955.00	2,954.79	3.41	0.95	177.79	32.43	0.00	216.42	213.43	2.99	72.376 CC, ES		
3,200.00	3,014.09	2,955.00	2,954.79	6.18	0.95	-0.62	32.43	0.00	315.53	310.65	4.89	64.553 SF		
3,300.00	3,014.48	2,955.00	2,954.79	9.19	0.95	-0.62	32.43	0.00	414.23	407.95	6.29	65.880		
3,400.00	3,014.87	2,955.00	2,954.79	12.39	0.95	-0.62	32.43	0.00	513.44	505.84	7.60	67.572		
3,500.00	3,015.26	2,955.00	2,954.79	15.75	0.95	-0.62	32.43	0.00	612.90	604.06	8.84	69.364		
3,600.00	3,015.65	2,955.00	2,954.79	19.23	0.95	-0.62	32.43	0.00	712.51	702.50	10.01	71.178		
3,700.00	3,016.04	2,955.00	2,954.79	22.78	0.95	-0.62	32.43	0.00	812.22	801.09	11.13	72.989		
3,800.00	3,016.43	2,955.00	2,954.79	26.41	0.95	-0.62	32.43	0.00	911.99	899.80	12.19	74.786		
3,900.00	3,016.82	2,955.00	2,954.79	30.07	0.95	-0.62	32.43	0.00	1,011.81	998.59	13.22	76.565		
4,000.00	3,017.21	2,955.00	2,954.79	33.78	0.95	-0.62	32.43	0.00	1,111.66	1,097.47	14.19	78.325		
4,100.00	3,017.60	2,955.00	2,954.79	37.51	0.95	-0.62	32.43	0.00	1,211.53	1,196.40	15.13	80.066		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #013m - Allison Unit #013m - Allison Unit #013m													Offset Site Error:	0.00 ft
Survey Program: 250-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		
4,500.00	3,019.16	2,987.05	2,986.65	61.95	11.90	88.28	463.80	-2,378.76	1,260.06	1,191.65	68.40	18.421		
4,600.00	3,019.56	2,986.36	2,985.96	65.78	11.89	88.24	463.77	-2,378.76	1,222.44	1,148.76	73.68	16.591		
4,700.00	3,019.95	2,985.67	2,985.26	69.61	11.89	88.21	463.75	-2,378.76	1,192.05	1,113.13	78.92	15.105		
4,800.00	3,020.34	2,984.97	2,984.57	73.45	11.89	88.17	463.72	-2,378.76	1,169.45	1,085.48	83.97	13.927		
4,900.00	3,020.73	2,984.28	2,983.87	77.29	11.89	88.14	463.70	-2,378.76	1,155.09	1,066.39	88.69	13.024		
5,000.00	3,021.12	2,983.58	2,983.18	81.14	11.88	88.10	463.68	-2,378.76	1,149.28	1,056.33	92.95	12.365		
5,016.91	3,021.18	2,983.46	2,983.06	81.79	11.88	88.10	463.67	-2,378.76	1,149.15	1,055.54	93.61	12.276 CC		
5,100.00	3,021.51	2,982.89	2,982.49	84.99	11.88	88.07	463.65	-2,378.76	1,152.15	1,055.54	96.62	11.925 ES		
5,200.00	3,021.90	2,982.19	2,981.79	88.85	11.88	88.04	463.63	-2,378.76	1,163.65	1,064.02	99.63	11.680		
5,300.00	3,022.29	2,981.50	2,981.10	92.70	11.87	88.00	463.60	-2,378.76	1,183.51	1,081.55	101.95	11.608 SF		
5,400.00	3,022.68	2,980.80	2,980.40	96.56	11.87	87.97	463.58	-2,378.76	1,211.32	1,107.72	103.61	11.692		
5,500.00	3,023.07	2,980.11	2,979.71	100.42	11.87	87.93	463.55	-2,378.76	1,246.56	1,141.92	104.64	11.913		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #024 - Allison Unit #024 - Allison Unit #024													Offset Site Error: 0.00 ft	
Survey Program: 3034-MWD													Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis			Distance		Minimum Separation		Separation Factor		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)	Separation (ft)	Factor		
0.00	0.00	0.00	0.00	0.00	0.00	95.57	-5.99	61.37	61.66					
100.00	100.00	100.00	100.00	0.19	0.21	95.96	-5.99	61.37	61.70	61.31	0.39	157.962		
200.00	199.99	199.99	199.99	0.50	0.42	97.05	-5.99	61.37	61.84	60.93	0.91	68.240		
300.00	299.98	299.98	299.98	0.92	0.63	98.25	-5.99	61.37	62.01	60.47	1.54	40.263		
400.00	399.97	399.97	399.97	1.34	0.84	99.44	-5.99	61.37	62.21	60.04	2.17	28.615		
500.00	499.97	499.97	499.97	1.76	1.05	100.63	-5.99	61.37	62.44	59.63	2.81	22.237		
600.00	599.96	599.96	599.96	2.18	1.26	101.80	-5.99	61.37	62.70	59.25	3.44	18.225		
700.00	699.95	699.95	699.95	2.59	1.47	102.86	-5.99	61.37	62.95	58.89	4.06	15.497		
800.00	799.95	799.95	799.95	3.00	1.68	103.76	-5.99	61.37	63.18	58.50	4.68	13.489		
900.00	899.94	899.94	899.94	3.41	1.89	104.49	-5.99	61.37	63.39	58.08	5.31	11.946		
1,000.00	999.94	999.94	999.94	3.82	2.10	105.06	-5.99	61.37	63.55	57.62	5.93	10.721		
1,100.00	1,099.94	1,099.94	1,099.94	4.24	2.32	105.47	-5.99	61.37	63.68	57.13	6.55	9.721		
1,200.00	1,199.94	1,199.94	1,199.94	4.65	2.53	105.85	-5.99	61.37	63.80	56.62	7.17	8.892		
1,300.00	1,299.94	1,299.94	1,299.94	5.06	2.74	106.23	-5.99	61.37	63.92	56.12	7.80	8.196		
1,400.00	1,399.94	1,399.94	1,399.94	5.48	2.95	106.60	-5.99	61.37	64.04	55.62	8.42	7.603		
1,500.00	1,499.93	1,499.93	1,499.93	5.89	3.16	106.98	-5.99	61.37	64.17	55.12	9.05	7.093		
1,600.00	1,599.93	1,599.93	1,599.93	6.31	3.37	107.36	-5.99	61.37	64.30	54.63	9.67	6.647		
1,700.00	1,699.93	1,699.93	1,699.93	6.73	3.58	107.95	-5.99	61.37	64.51	54.21	10.30	6.260		
1,800.00	1,799.93	1,799.93	1,799.93	7.15	3.79	108.80	-5.99	61.37	64.83	53.89	10.94	5.929		
1,900.00	1,899.92	1,899.92	1,899.92	7.57	4.00	109.91	-5.99	61.37	65.27	53.71	11.57	5.643		
2,000.00	1,999.90	1,999.90	1,999.90	7.99	4.21	111.26	-5.99	61.37	65.85	53.66	12.20	5.400		
2,100.00	2,099.89	2,099.89	2,099.89	8.40	4.42	112.61	-5.99	61.37	66.48	53.66	12.82	5.185		
2,200.00	2,199.88	2,199.88	2,199.88	8.82	4.63	113.87	-5.99	61.37	67.11	53.66	13.45	4.991		
2,300.00	2,299.87	2,299.87	2,299.87	9.23	4.84	115.03	-5.99	61.37	67.73	53.66	14.07	4.814		
2,400.00	2,399.86	2,399.86	2,399.86	9.65	5.05	116.11	-5.99	61.37	68.34	53.65	14.70	4.651		
2,500.00	2,499.85	2,499.85	2,499.85	10.06	5.26	117.10	-5.99	61.37	68.94	53.62	15.32	4.500 ES		
2,600.00	2,599.84	2,599.84	2,599.84	10.47	5.47	118.11	-5.99	61.37	69.58	53.64	15.95	4.364		
2,700.00	2,699.83	2,699.83	2,699.83	10.89	5.68	119.17	-5.99	61.37	70.29	53.72	16.57	4.242 SF		
2,800.00	2,799.05	2,799.05	2,799.05	11.08	5.89	-139.18	-5.99	61.37	77.62	60.66	16.96	4.577		
2,900.00	2,889.61	2,889.61	2,889.61	11.23	6.08	-147.33	-5.99	61.37	111.92	94.66	17.27	6.482		
3,000.00	2,960.62	2,960.62	2,960.62	11.65	6.23	-151.20	-5.99	61.37	176.43	158.79	17.64	10.001		
3,100.00	3,003.52	3,003.52	3,003.52	13.02	6.32	-141.42	-5.99	61.37	263.29	245.36	17.93	14.685		
3,200.00	3,014.09	3,014.09	3,014.09	15.33	6.34	-91.42	-5.99	61.37	360.71	342.68	18.03	20.001		
3,300.00	3,014.48	3,014.48	3,014.48	18.19	6.35	-91.81	-5.99	61.37	459.75	441.70	18.06	25.461		
3,400.00	3,014.87	3,014.87	3,014.87	21.37	6.35	-92.21	-5.99	61.37	559.13	541.06	18.07	30.934		
3,500.00	3,015.26	3,015.26	3,015.26	24.76	6.35	-92.61	-5.99	61.37	658.70	640.61	18.09	36.411		
3,600.00	3,015.65	3,015.65	3,015.65	28.28	6.35	-93.01	-5.99	61.37	758.39	740.28	18.11	41.886		
3,700.00	3,016.04	3,016.04	3,016.04	31.88	6.35	-93.40	-5.99	61.37	858.14	840.02	18.12	47.355		
3,800.00	3,016.43	3,016.43	3,016.43	35.54	6.35	-93.80	-5.99	61.37	957.95	939.81	18.14	52.816		
3,900.00	3,016.82	3,016.82	3,016.82	39.25	6.35	-94.19	-5.99	61.37	1,057.79	1,039.64	18.15	58.267		
4,000.00	3,017.21	3,017.21	3,017.21	42.99	6.35	-94.59	-5.99	61.37	1,157.66	1,139.49	18.17	63.706		
4,100.00	3,017.60	3,017.60	3,017.60	46.75	6.35	-94.98	-5.99	61.37	1,257.55	1,239.36	18.19	69.130		

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



Anticollision Report



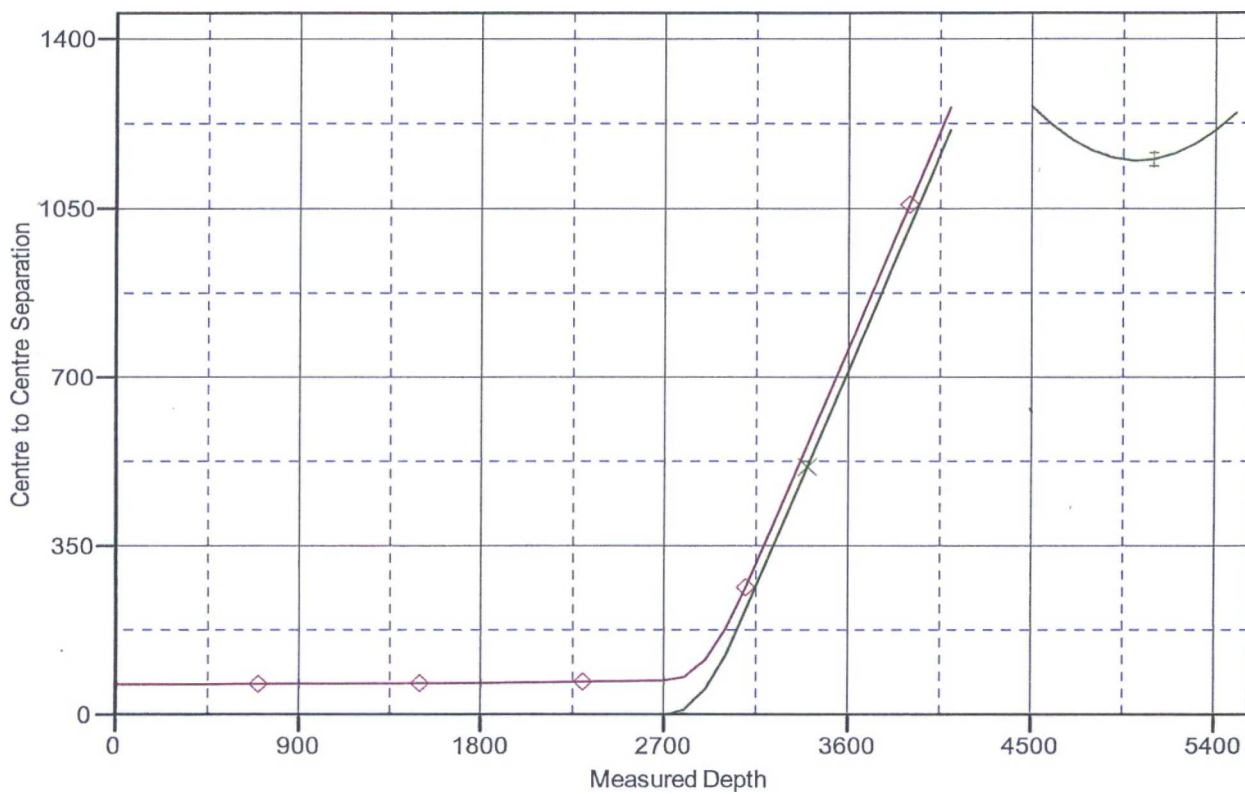
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 1
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND

145H, OH, OH V0

— Allison Unit #013m, Allison Unit #013m, Allison Unit #013m V0 — Allison Unit #024, Allison Unit #024, Allison Unit #024



Anticollision Report



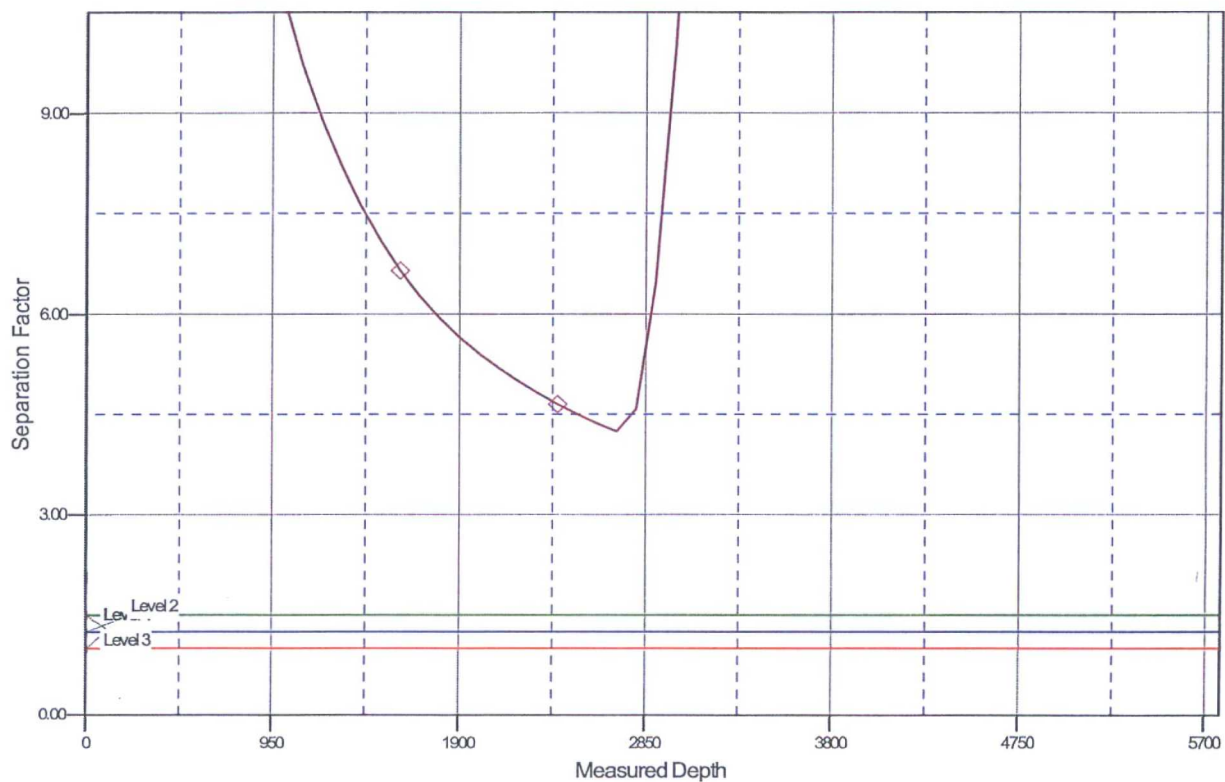
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 1
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND

145H, OH, OH V0

— Allison Unit #013m, Allison Unit #013m, Allison Unit #013m V0 — Allison Unit #024, Allison Unit #024, Allison



HILCORP ENERGY COMPANY
ALLISON UNIT #145 Lat 1ST01
SAN JUAN BASIN NM
6519' GL + 15' KB



WELL DETAILS: Allison Unit #145H

+N/-S	+E/-W	Northing	Ground Level:	6519.00	Latitude	Longitude
0.00	0.00	2179789.300	Easting	595785.900	36° 59' 23.953 N	107° 30' 19.296 W

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

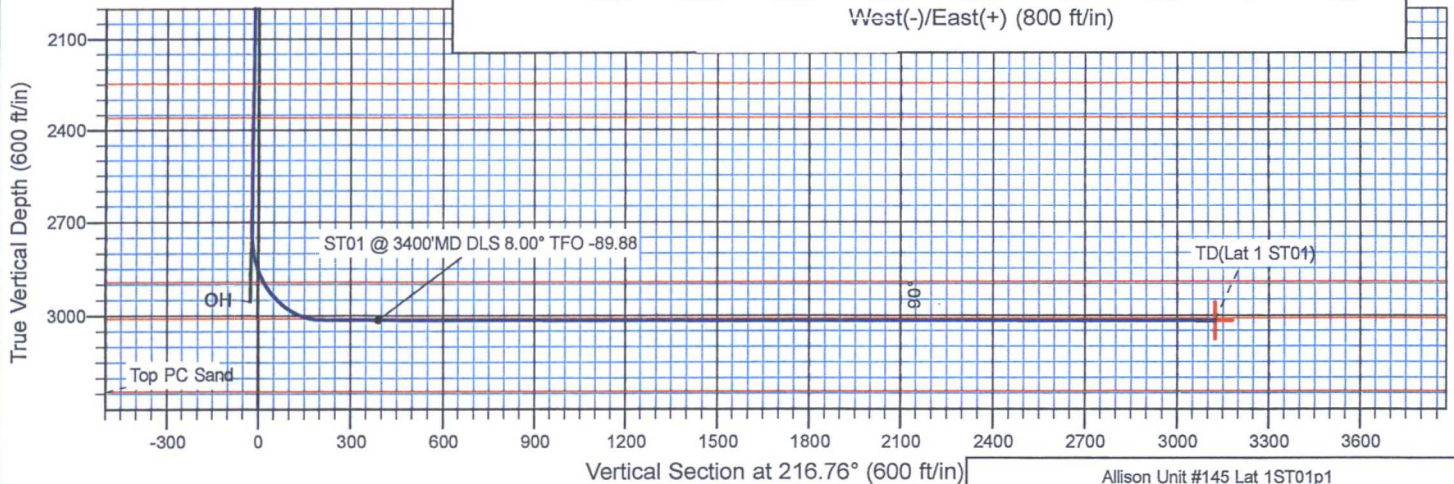
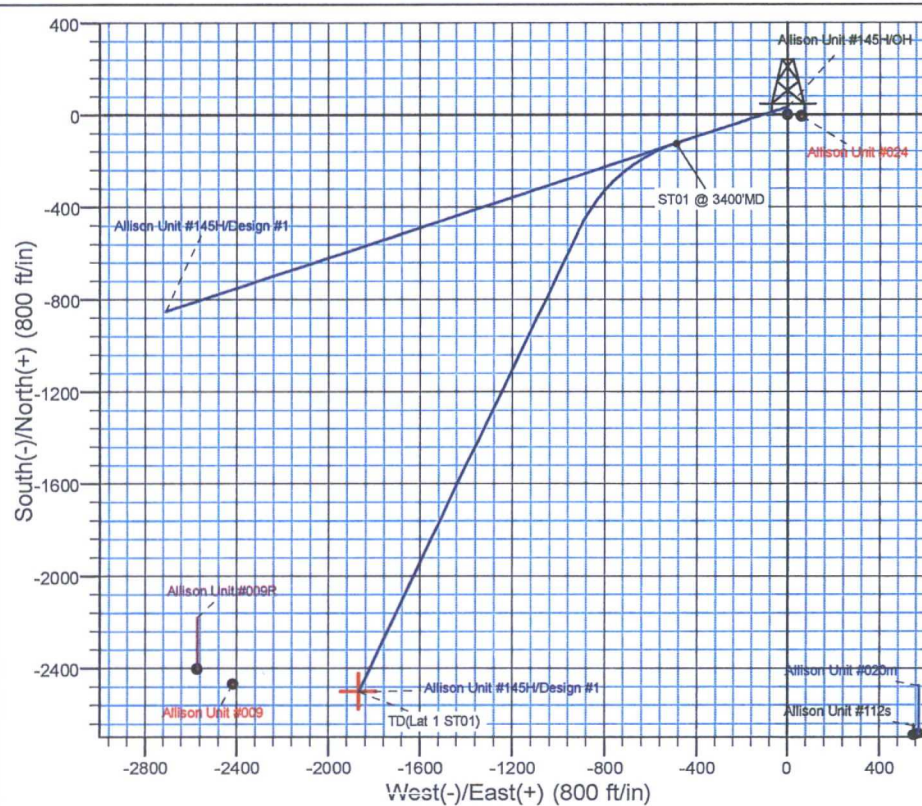
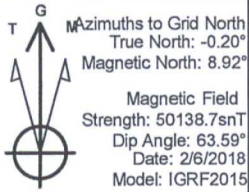
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	3400.00	89.78	251.89	3014.87	-125.44	-484.86	0.00	0.00	390.64	
2	3978.73	89.93	205.60	3016.42	-496.76	-908.19	8.00	-89.88	941.47	
3	6202.50	89.93	205.60	3019.00	-2502.31	-1868.90	0.00	0.00	3123.19	TD(Lat 1 ST01)

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD(Lat 1 ST01)	3019.00	-2502.31	-1868.90	2177287.000	593917.000	36° 58' 59.273 N	107° 30' 42.437 W	Point



Allison Unit #145 Lat 1ST01p1

Created By: Frank Scardino Date: 2/7/2018
 Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 1 ST01

Plan: Design #1

Standard Planning Report

07 February, 2018





Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 1 ST01		
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 #145H		
Site Position:		Northing:	2,179,789.300 usft
From:	Map	Easting:	595,785.900 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 59' 23.953 N
		Longitude:	107° 30' 19.296 W
		Grid Convergence:	0.20 °

Well	Allison Unit #145H		
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' 23.953 N
		Longitude:	107° 30' 19.296 W
		Ground Level:	6,519.00 ft

Wellbore	Lat 1 ST01		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	2/6/2018	9.12
			Dip Angle (°)
			63.59
			Field Strength (nT)
			50,139

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			3,400.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction (°)
			216.76

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
3,400.00	89.78	251.89	3,014.87	-125.44	-484.86	0.00	0.00	0.00	0.00	
3,978.73	89.93	205.60	3,016.42	-496.76	-908.19	8.00	0.03	-8.00	-89.88	
6,202.50	89.93	205.60	3,019.00	-2,502.31	-1,868.90	0.00	0.00	0.00	0.00	TD(Lat 1 ST01)



Planning Report



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 1 ST01
Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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)
3,400.00	89.78	251.89	3,014.87	-125.44	-484.86	390.64	0.00	0.00	0.00
ST01 @ 3400' MD DLS 8.00° TFO -89.88									
3,450.00	89.79	247.89	3,015.06	-142.63	-531.80	432.50	8.00	0.02	-8.00
3,500.00	89.80	243.89	3,015.25	-163.04	-577.43	476.16	8.00	0.02	-8.00
3,550.00	89.81	239.89	3,015.42	-186.59	-621.52	521.42	8.00	0.02	-8.00
3,600.00	89.82	235.89	3,015.58	-213.16	-663.87	568.04	8.00	0.02	-8.00
3,650.00	89.83	231.89	3,015.74	-242.62	-704.26	615.81	8.00	0.03	-8.00
3,700.00	89.85	227.89	3,015.88	-274.82	-742.49	664.49	8.00	0.03	-8.00
3,750.00	89.86	223.89	3,016.01	-309.62	-778.39	713.85	8.00	0.03	-8.00
3,800.00	89.87	219.89	3,016.12	-346.83	-811.77	763.64	8.00	0.03	-8.00
3,850.00	89.89	215.89	3,016.22	-386.28	-842.47	813.62	8.00	0.03	-8.00
3,900.00	89.91	211.89	3,016.31	-427.77	-870.35	863.54	8.00	0.03	-8.00
3,950.00	89.92	207.89	3,016.39	-471.11	-895.26	913.18	8.00	0.03	-8.00
3,978.73	89.93	205.60	3,016.42	-496.76	-908.19	941.47	8.00	0.03	-8.00
4,000.00	89.93	205.60	3,016.45	-515.95	-917.38	962.33	0.00	0.00	0.00
4,100.00	89.93	205.60	3,016.56	-606.13	-960.58	1,060.44	0.00	0.00	0.00
4,200.00	89.93	205.60	3,016.68	-696.32	-1,003.78	1,158.55	0.00	0.00	0.00
4,300.00	89.93	205.60	3,016.79	-786.51	-1,046.99	1,256.66	0.00	0.00	0.00
4,400.00	89.93	205.60	3,016.91	-876.69	-1,090.19	1,354.77	0.00	0.00	0.00
4,500.00	89.93	205.60	3,017.03	-966.88	-1,133.39	1,452.88	0.00	0.00	0.00
4,600.00	89.93	205.60	3,017.14	-1,057.07	-1,176.59	1,550.99	0.00	0.00	0.00
4,700.00	89.93	205.60	3,017.26	-1,147.25	-1,219.79	1,649.10	0.00	0.00	0.00
4,800.00	89.93	205.60	3,017.37	-1,237.44	-1,263.00	1,747.21	0.00	0.00	0.00
4,900.00	89.93	205.60	3,017.49	-1,327.63	-1,306.20	1,845.32	0.00	0.00	0.00
5,000.00	89.93	205.60	3,017.61	-1,417.81	-1,349.40	1,943.43	0.00	0.00	0.00
5,100.00	89.93	205.60	3,017.72	-1,508.00	-1,392.60	2,041.54	0.00	0.00	0.00
5,200.00	89.93	205.60	3,017.84	-1,598.18	-1,435.80	2,139.64	0.00	0.00	0.00
5,300.00	89.93	205.60	3,017.95	-1,688.37	-1,479.01	2,237.75	0.00	0.00	0.00
5,400.00	89.93	205.60	3,018.07	-1,778.56	-1,522.21	2,335.86	0.00	0.00	0.00
5,500.00	89.93	205.60	3,018.19	-1,868.74	-1,565.41	2,433.97	0.00	0.00	0.00
5,600.00	89.93	205.60	3,018.30	-1,958.93	-1,608.61	2,532.08	0.00	0.00	0.00
5,700.00	89.93	205.60	3,018.42	-2,049.12	-1,651.81	2,630.19	0.00	0.00	0.00
5,800.00	89.93	205.60	3,018.53	-2,139.30	-1,695.01	2,728.30	0.00	0.00	0.00
5,900.00	89.93	205.60	3,018.65	-2,229.49	-1,738.22	2,826.41	0.00	0.00	0.00
6,000.00	89.93	205.60	3,018.77	-2,319.68	-1,781.42	2,924.52	0.00	0.00	0.00
6,100.00	89.93	205.60	3,018.88	-2,409.86	-1,824.62	3,022.63	0.00	0.00	0.00
6,202.50	89.93	205.60	3,019.00	-2,502.31	-1,868.90	3,123.19	0.00	0.00	0.00
TD(Lat 1 ST01)									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
TD(Lat 1 ST01)	0.00	0.00	3,019.00	-2,502.31	-1,868.90	2,177,287.000	593,917.000	36° 58' 59.273 N	107° 30' 42.437 W
- hit/miss target									
- Shape									
- plan hits target center									
- Point									



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 1 ST01		
Design:	Design #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,400.00	3,014.87	-125.44	-484.86	ST01 @ 3400'MD DLS 8.00° TFO -89.88



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 1 ST01

Design #1

Anticollision Report

07 February, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1 ST01	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 1,266.90 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	2/7/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,726.36	OH (OH)	MWD	MWD - Standard	
2,726.36	3,400.00	Design #1 (Lat 1)	MWD	MWD - Standard	
3,400.00	6,202.50	Design #1 (Lat 1 ST01)	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 #145H						
Allison Unit #145H - Lat 1 - Design #1	3,800.00	3,779.53	108.83	87.95	5.213	CC, ES, SF
Allison Unit #145H - OH - OH	3,100.00	2,955.00	216.42	213.43	72.376	CC, ES
Allison Unit #145H - OH - OH	3,200.00	2,955.00	315.53	310.65	64.553	SF
Allison Unit #145H Offsets						
Allison Unit #009 - Allison Unit #009 - Allison Unit #009	6,202.50	3,019.00	547.94	470.97	7.118	CC, ES, SF
Allison Unit #009m - Allison Unit #009m - Allison Unit #00						Out of range
Allison Unit #009R - Allison Unit #009R - Allison Unit #00	6,202.50	3,015.76	717.73	629.50	8.135	CC, ES, SF
Allison Unit #013m - Allison Unit #013m - Allison Unit #0						Out of range
Allison Unit #020m - Allison Unit #020m - Allison Unit #0						Out of range
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	0.00	0.00	61.66			
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,500.00	2,499.85	68.94	53.62	4.500	ES
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,700.00	2,699.83	70.29	53.72	4.242	SF
Allison Unit #024A - Allison Unit #024A - Allison Unit #02						Out of range
Allison Unit #039m - Allison Unit #039m - Allison Unit #0						Out of range
Allison Unit #039N - Wellbore #1 - Wellbore #1						Out of range
Allison Unit #061 - Allison Unit #061 - Allison Unit #061						Out of range
Allison Unit #061m - Allison Unit #061m - Allison Unit #0						Out of range
Allison Unit #061N - Allison Unit #061N - Allison Unit #06						Out of range
Allison Unit #112s - Allison Unit #112s - Wellbore #1						Out of range
Allison Unit #125s - Allison Unit #125s - Allison Unit #125						Out of range
Allison Unit #133s - Allison Unit #133s - Allison Unit #133						Out of range
Allison Unit #134s - Allison Unit #134s - Allison Unit #134						Out of range
Allison Unit 057N - Allison Unit #057N - Allison Unit #057						Out of range

Offset Design	Allison Unit #145H - Allison Unit #145H - Lat 1 - Design #1											Offset Site Error:	0.00 ft
Survey Program:	156-MWD, 2726-MWD											Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		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	Warning
3,400.00	3,014.87	3,400.00	3,014.87	0.00	0.00	0.00	-125.44	-484.86	0.00	0.00	0.00	N/A	
3,410.13	3,014.91	3,410.13	3,014.91	0.18	0.35	90.12	-128.59	-494.49	0.07	-0.46	0.53	0.135	Level 1

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - Lat 1 - Design #1													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2728-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		
3,500.00	3,015.25	3,499.68	3,015.26	1.78	3.44	90.15	-156.42	-579.60	6.97	1.76	5.21	1.337	Level 3	
3,600.00	3,015.58	3,597.41	3,015.64	3.43	6.92	90.18	-186.79	-672.49	27.74	17.42	10.32	2.687		
3,700.00	3,015.88	3,691.30	3,016.01	5.48	10.32	90.20	-215.97	-761.73	61.92	46.26	15.65	3.955		
3,800.00	3,016.12	3,779.53	3,016.35	7.71	13.57	90.22	-243.39	-845.59	108.83	87.95	20.88	5.213	CC, ES, SF	
3,900.00	3,016.31	3,860.36	3,016.67	9.94	16.56	90.24	-268.51	-922.42	167.56	141.81	25.74	6.509		
4,000.00	3,016.45	3,932.47	3,016.95	12.08	19.25	90.25	-290.92	-990.95	236.75	206.65	30.10	7.866		
4,100.00	3,016.56	4,001.56	3,017.22	14.16	21.84	90.25	-312.39	-1,056.62	309.05	274.80	34.24	9.025		
4,200.00	3,016.68	4,070.65	3,017.49	16.32	24.44	90.25	-333.86	-1,122.29	381.34	342.90	38.44	9.921		
4,300.00	3,016.79	4,139.74	3,017.76	18.55	27.05	90.25	-355.33	-1,187.96	453.64	410.97	42.67	10.632		
4,400.00	3,016.91	4,208.83	3,018.03	20.84	29.67	90.25	-376.80	-1,253.63	525.93	479.01	46.93	11.208		
4,500.00	3,017.03	4,277.92	3,018.30	23.18	32.29	90.25	-398.28	-1,319.30	598.23	547.01	51.21	11.681		
4,600.00	3,017.14	4,347.01	3,018.57	25.55	34.92	90.25	-419.75	-1,384.97	670.52	615.00	55.52	12.077		
4,700.00	3,017.26	4,416.10	3,018.84	27.97	37.56	90.25	-441.22	-1,450.64	742.82	682.97	59.85	12.412		
4,800.00	3,017.37	4,485.19	3,019.11	30.41	40.19	90.25	-462.69	-1,516.30	815.11	750.92	64.19	12.698		
4,900.00	3,017.49	4,554.28	3,019.38	32.87	42.84	90.25	-484.16	-1,581.97	887.40	818.85	68.55	12.945		
5,000.00	3,017.61	4,623.37	3,019.65	35.36	45.48	90.25	-505.63	-1,647.64	959.70	886.78	72.92	13.161		
5,100.00	3,017.72	4,692.46	3,019.92	37.87	48.13	90.25	-527.10	-1,713.31	1,031.99	954.69	77.31	13.350		
5,200.00	3,017.84	4,761.55	3,020.19	40.39	50.78	90.25	-548.58	-1,778.98	1,104.29	1,022.59	81.70	13.517		
5,300.00	3,017.95	4,830.64	3,020.46	42.93	53.44	90.25	-570.05	-1,844.65	1,176.58	1,090.48	86.10	13.665		
5,400.00	3,018.07	4,899.73	3,020.72	45.48	56.09	90.25	-591.52	-1,910.32	1,248.88	1,158.37	90.51	13.798		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 156-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		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
2,726.36	2,726.17	2,726.34	2,726.16	0.00	0.00	166.92	28.67	0.00	0.89					
2,800.00	2,799.05	2,799.19	2,799.00	0.33	0.30	176.50	29.82	0.00	9.42	8.82	0.60	15.736		
2,900.00	2,889.61	2,889.54	2,889.34	0.85	0.68	178.36	31.31	0.00	51.07	49.69	1.38	37.099		
3,000.00	2,960.62	2,955.00	2,954.79	0.85	0.95	178.77	32.43	0.00	121.24	119.74	1.49	81.249		
3,100.00	3,003.52	2,955.00	2,954.79	3.41	0.95	177.79	32.43	0.00	216.42	213.43	2.99	72.376 CC, ES		
3,200.00	3,014.09	2,955.00	2,954.79	6.18	0.95	-0.62	32.43	0.00	315.53	310.65	4.89	64.553 SF		
3,300.00	3,014.48	2,955.00	2,954.79	9.19	0.95	-0.62	32.43	0.00	414.23	407.95	6.29	65.880		
3,400.00	3,014.87	2,955.00	2,954.79	12.39	0.95	-0.62	32.43	0.00	513.44	505.84	7.60	67.572		
3,500.00	3,015.25	2,955.00	2,954.79	13.91	0.95	-53.42	32.43	0.00	612.61	604.85	7.76	78.915		
3,600.00	3,015.58	2,955.00	2,954.79	15.70	0.95	-70.86	32.43	0.00	710.44	701.67	8.77	81.003		
3,700.00	3,015.88	2,955.00	2,954.79	17.81	0.95	-77.66	32.43	0.00	805.87	795.73	10.14	79.487		
3,800.00	3,016.12	2,955.00	2,954.79	20.02	0.95	-81.08	32.43	0.00	898.09	886.41	11.68	76.895		
3,900.00	3,016.31	2,955.00	2,954.79	22.17	0.95	-83.08	32.43	0.00	986.45	973.22	13.23	74.557		
4,000.00	3,016.45	2,955.00	2,954.79	24.16	0.95	-84.14	32.43	0.00	1,070.56	1,055.89	14.67	72.956		
4,100.00	3,016.56	2,955.00	2,954.79	26.08	0.95	-84.14	32.43	0.00	1,155.12	1,139.20	15.92	72.555		
4,200.00	3,016.68	2,955.00	2,954.79	28.05	0.95	-84.14	32.43	0.00	1,241.97	1,224.92	17.05	72.835		

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 #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 1 ST01
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H Offsets - Allison Unit #009 - Allison Unit #009 - Allison Unit #009													Offset Site Error:	0.00 ft
Survey Program: 3034-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		
5,300.00	3,017.95	3,017.95	3,017.95	60.19	6.35	89.86	-2,468.22	-2,415.78	1,218.90	1,194.37	24.54	49.675		
5,400.00	3,018.07	3,018.07	3,018.07	62.65	6.35	89.87	-2,468.22	-2,415.78	1,128.77	1,102.17	26.60	42.438		
5,500.00	3,018.19	3,018.19	3,018.19	65.13	6.35	89.88	-2,468.22	-2,415.78	1,040.44	1,011.08	29.36	35.431		
5,600.00	3,018.30	3,018.30	3,018.30	67.63	6.35	89.89	-2,468.22	-2,415.78	954.42	921.47	32.95	28.966		
5,700.00	3,018.42	3,018.42	3,018.42	70.14	6.35	89.91	-2,468.22	-2,415.78	871.38	833.90	37.48	23.251		
5,800.00	3,018.53	3,018.53	3,018.53	72.66	6.35	89.92	-2,468.22	-2,415.78	792.27	749.19	43.08	18.390		
5,900.00	3,018.65	3,018.65	3,018.65	75.20	6.35	89.93	-2,468.22	-2,415.78	718.40	668.51	49.89	14.400		
6,000.00	3,018.77	3,018.77	3,018.77	77.75	6.35	89.95	-2,468.22	-2,415.78	651.53	593.59	57.94	11.246		
6,100.00	3,018.88	3,018.88	3,018.88	80.31	6.36	89.96	-2,468.22	-2,415.78	594.04	526.97	67.07	8.857		
6,200.00	3,019.00	3,019.00	3,019.00	82.87	6.36	89.97	-2,468.22	-2,415.78	548.89	472.15	76.73	7.153		
6,202.50	3,019.00	3,019.00	3,019.00	82.94	6.36	89.97	-2,468.22	-2,415.78	547.94	470.97	76.97	7.118 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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #009R - Allison Unit #009R - Allison Unit #009R													Offset Site Error: 0.00 ft	
Survey Program: 230-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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,400.00	3,018.07	3,033.27	3,032.74	62.65	12.16	91.11	-2,352.07	-2,570.82	1,195.29	1,156.14	39.14	30.536		
5,500.00	3,018.19	3,031.05	3,030.52	65.13	12.15	90.93	-2,352.12	-2,570.82	1,115.64	1,072.54	43.09	25.888		
5,600.00	3,018.30	3,028.84	3,028.32	67.63	12.14	90.75	-2,352.18	-2,570.82	1,039.51	991.77	47.74	21.775		
5,700.00	3,018.42	3,026.64	3,026.12	70.14	12.13	90.57	-2,352.24	-2,570.82	967.73	914.62	53.11	18.220		
5,800.00	3,018.53	3,024.46	3,023.93	72.66	12.12	90.39	-2,352.29	-2,570.82	901.34	842.12	59.22	15.220		
5,900.00	3,018.65	3,022.28	3,021.76	75.20	12.12	90.21	-2,352.35	-2,570.82	841.62	775.61	66.01	12.750		
6,000.00	3,018.77	3,020.11	3,019.59	77.75	12.11	90.03	-2,352.40	-2,570.82	790.07	716.76	73.31	10.777		
6,100.00	3,018.88	3,017.96	3,017.44	80.31	12.10	89.86	-2,352.46	-2,570.82	748.40	667.58	80.82	9.260		
6,200.00	3,019.00	3,015.81	3,015.29	82.87	12.09	89.68	-2,352.51	-2,570.82	718.32	630.26	88.06	8.157		
6,202.50	3,019.00	3,015.76	3,015.24	82.94	12.09	89.67	-2,352.51	-2,570.82	717.73	629.50	88.23	8.135 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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 1 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #024 - Allison Unit #024 - Allison Unit #024													Offset Site Error:	0.00 ft
Survey Program: 3034-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		
0.00	0.00	0.00	0.00	0.00	0.00	95.57	-5.99	61.37	61.66					
100.00	100.00	100.00	100.00	0.19	0.21	95.96	-5.99	61.37	61.70	61.31	0.39	157.962		
200.00	199.99	199.99	199.99	0.50	0.42	97.05	-5.99	61.37	61.84	60.93	0.91	68.240		
300.00	299.98	299.98	299.98	0.92	0.63	98.25	-5.99	61.37	62.01	60.47	1.54	40.263		
400.00	399.97	399.97	399.97	1.34	0.84	99.44	-5.99	61.37	62.21	60.04	2.17	28.615		
500.00	499.97	499.97	499.97	1.76	1.05	100.63	-5.99	61.37	62.44	59.63	2.81	22.237		
600.00	599.96	599.96	599.96	2.18	1.26	101.80	-5.99	61.37	62.70	59.25	3.44	18.225		
700.00	699.95	699.95	699.95	2.59	1.47	102.86	-5.99	61.37	62.95	58.89	4.06	15.497		
800.00	799.95	799.95	799.95	3.00	1.68	103.76	-5.99	61.37	63.18	58.50	4.68	13.489		
900.00	899.94	899.94	899.94	3.41	1.89	104.49	-5.99	61.37	63.39	58.08	5.31	11.946		
1,000.00	999.94	999.94	999.94	3.82	2.10	105.06	-5.99	61.37	63.55	57.62	5.93	10.721		
1,100.00	1,099.94	1,099.94	1,099.94	4.24	2.32	105.47	-5.99	61.37	63.68	57.13	6.55	9.721		
1,200.00	1,199.94	1,199.94	1,199.94	4.65	2.53	105.85	-5.99	61.37	63.80	56.62	7.17	8.892		
1,300.00	1,299.94	1,299.94	1,299.94	5.06	2.74	106.23	-5.99	61.37	63.92	56.12	7.80	8.196		
1,400.00	1,399.94	1,399.94	1,399.94	5.48	2.95	106.60	-5.99	61.37	64.04	55.62	8.42	7.603		
1,500.00	1,499.93	1,499.93	1,499.93	5.89	3.16	106.98	-5.99	61.37	64.17	55.12	9.05	7.093		
1,600.00	1,599.93	1,599.93	1,599.93	6.31	3.37	107.36	-5.99	61.37	64.30	54.63	9.67	6.647		
1,700.00	1,699.93	1,699.93	1,699.93	6.73	3.58	107.95	-5.99	61.37	64.51	54.21	10.30	6.260		
1,800.00	1,799.93	1,799.93	1,799.93	7.15	3.79	108.80	-5.99	61.37	64.83	53.89	10.94	5.929		
1,900.00	1,899.92	1,899.92	1,899.92	7.57	4.00	109.91	-5.99	61.37	65.27	53.71	11.57	5.643		
2,000.00	1,999.90	1,999.90	1,999.90	7.99	4.21	111.26	-5.99	61.37	65.85	53.66	12.20	5.400		
2,100.00	2,099.89	2,099.89	2,099.89	8.40	4.42	112.61	-5.99	61.37	66.48	53.66	12.82	5.185		
2,200.00	2,199.88	2,199.88	2,199.88	8.82	4.63	113.87	-5.99	61.37	67.11	53.66	13.45	4.991		
2,300.00	2,299.87	2,299.87	2,299.87	9.23	4.84	115.03	-5.99	61.37	67.73	53.66	14.07	4.814		
2,400.00	2,399.86	2,399.86	2,399.86	9.65	5.05	116.11	-5.99	61.37	68.34	53.65	14.70	4.651		
2,500.00	2,499.85	2,499.85	2,499.85	10.06	5.26	117.10	-5.99	61.37	68.94	53.62	15.32	4.500 ES		
2,600.00	2,599.84	2,599.84	2,599.84	10.47	5.47	118.11	-5.99	61.37	69.58	53.64	15.95	4.364		
2,700.00	2,699.83	2,699.83	2,699.83	10.89	5.68	119.17	-5.99	61.37	70.29	53.72	16.57	4.242 SF		
2,800.00	2,799.05	2,799.05	2,799.05	11.08	5.89	-139.18	-5.99	61.37	77.62	60.66	16.96	4.577		
2,900.00	2,889.61	2,889.61	2,889.61	11.23	6.08	-147.33	-5.99	61.37	111.92	94.66	17.27	6.482		
3,000.00	2,960.62	2,960.62	2,960.62	11.65	6.23	-151.20	-5.99	61.37	176.43	158.79	17.64	10.001		
3,100.00	3,003.52	3,003.52	3,003.52	13.02	6.32	-141.42	-5.99	61.37	263.29	245.36	17.93	14.685		
3,200.00	3,014.09	3,014.09	3,014.09	15.33	6.34	-91.42	-5.99	61.37	360.71	342.68	18.03	20.001		
3,300.00	3,014.48	3,014.48	3,014.48	18.19	6.35	-91.81	-5.99	61.37	459.75	441.70	18.06	25.461		
3,400.00	3,014.87	3,014.87	3,014.87	21.37	6.35	-92.21	-5.99	61.37	559.13	541.06	18.07	30.934		
3,500.00	3,015.25	3,015.25	3,015.25	23.14	6.35	-90.94	-5.99	61.37	657.82	638.39	19.43	33.853		
3,600.00	3,015.58	3,015.58	3,015.58	24.76	6.35	-90.55	-5.99	61.37	754.25	734.86	19.39	38.905		
3,700.00	3,015.88	3,015.88	3,015.88	26.61	6.35	-90.35	-5.99	61.37	847.62	828.22	19.40	43.696		
3,800.00	3,016.12	3,016.12	3,016.12	28.52	6.35	-90.23	-5.99	61.37	937.30	917.84	19.47	48.147		
3,900.00	3,016.31	3,016.31	3,016.31	30.37	6.35	-90.14	-5.99	61.37	1,022.74	1,003.16	19.58	52.226		
4,000.00	3,016.45	3,016.45	3,016.45	32.10	6.35	-90.09	-5.99	61.37	1,103.63	1,083.91	19.72	55.952		
4,100.00	3,016.56	3,016.56	3,016.56	33.79	6.35	-90.10	-5.99	61.37	1,185.14	1,165.22	19.92	59.484		

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



Anticollision Report



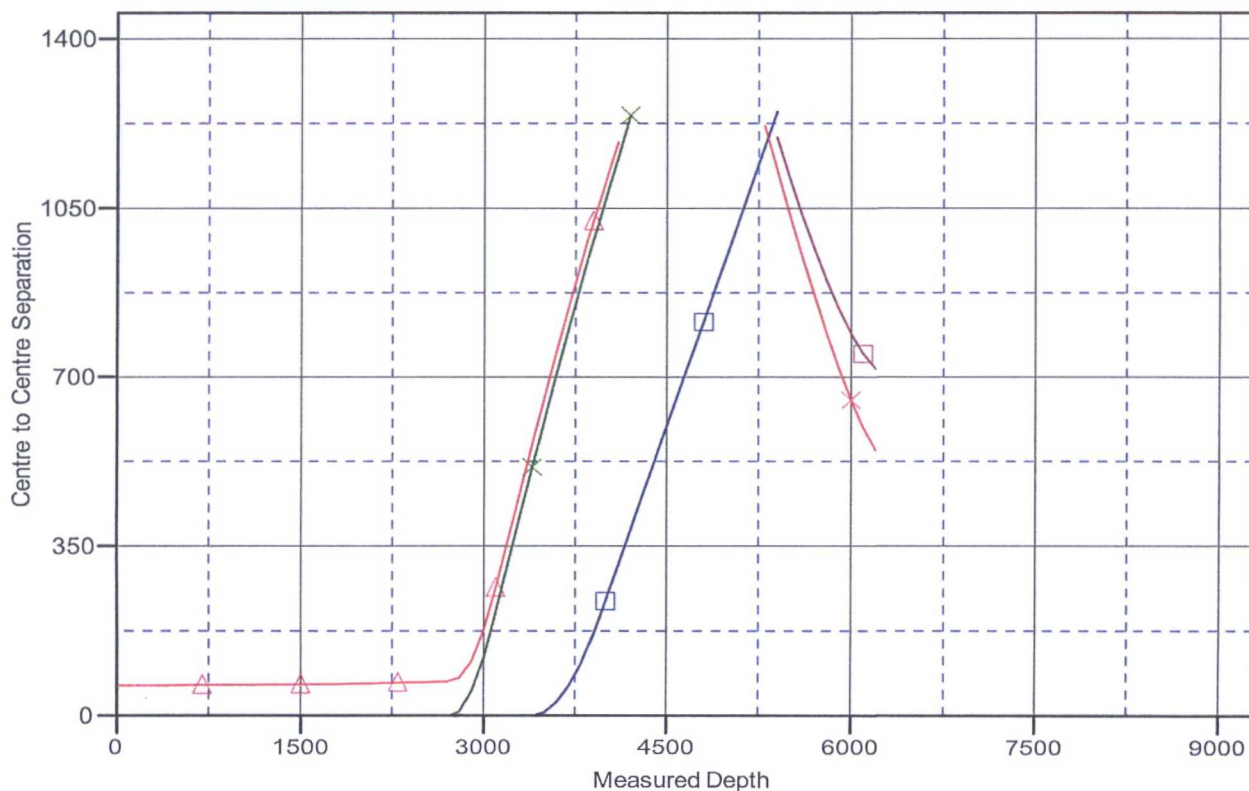
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 1 ST01
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND

#145H, Lat 1, Design #1 V0
#145H, OH, OH V0

✕ Allison Unit #009, Allison Unit #009, Allison Unit #009 V0
□ Allison Unit #009R, Allison Unit #009R, Allison Unit #009R V0

△ Allison Unit #024, Allison Unit #024, Allison Unit #024 V0

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



Anticollision Report



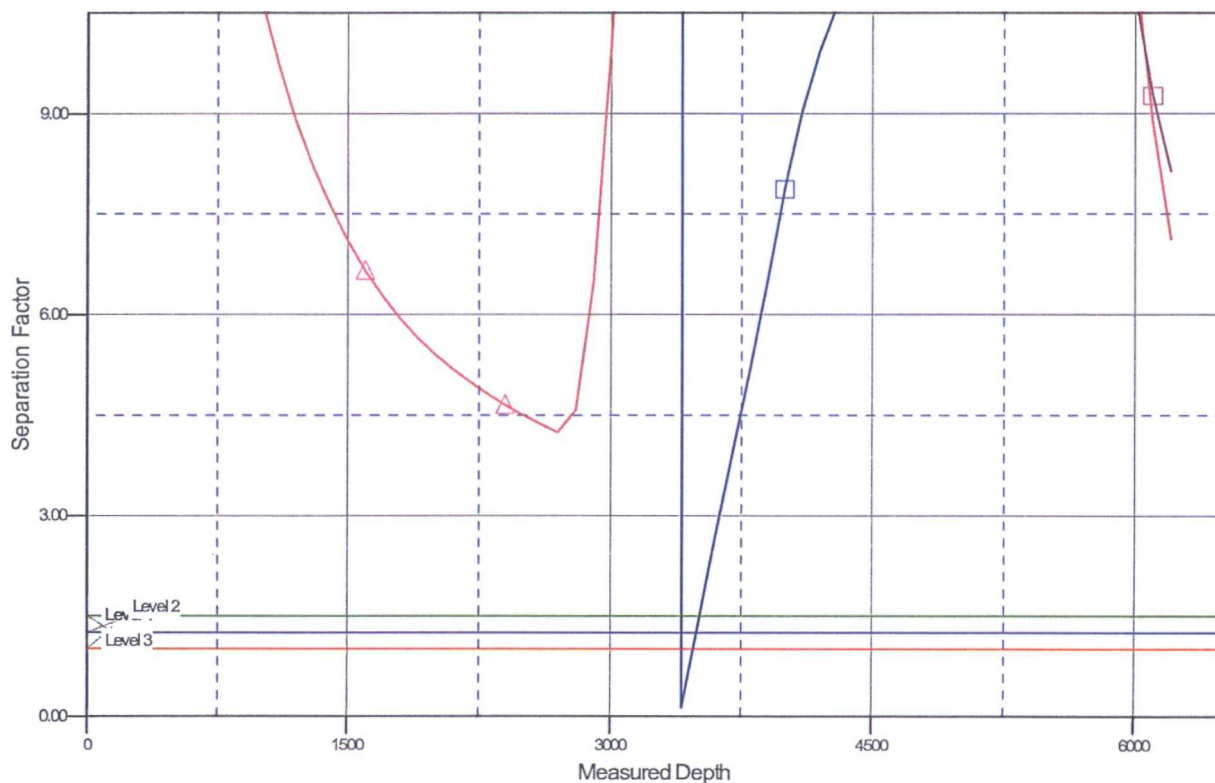
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 1 ST01
Reference Design: Design #1

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND

#145H, Lat 1, Design #1 V0
#145H, OH, OH V0

✖ Allison Unit #009, Allison Unit #009, Allison Unit #009 V0
⊠ Allison Unit #009R, Allison Unit #009R, Allison Unit #009R V0

▲ Allison Unit #024, Allison Unit #024, Allison Unit #024 V0



HILCORP ENERGY COMPANY
ALLISON UNIT #145 Lat 2
SAN JUAN BASIN NM
6519' GL + 15' KB



WELL DETAILS: Allison Unit #145H

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.00	0.00	2179789.300	6519.00	595785.900	36° 59' 23.953 N	107° 30' 19.296 W

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

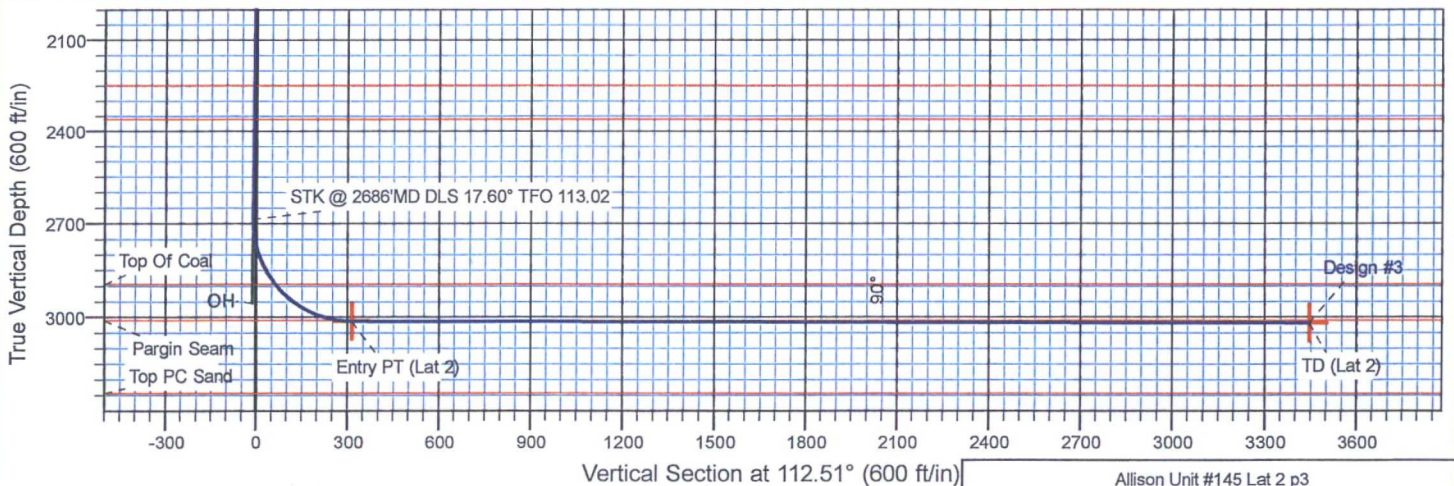
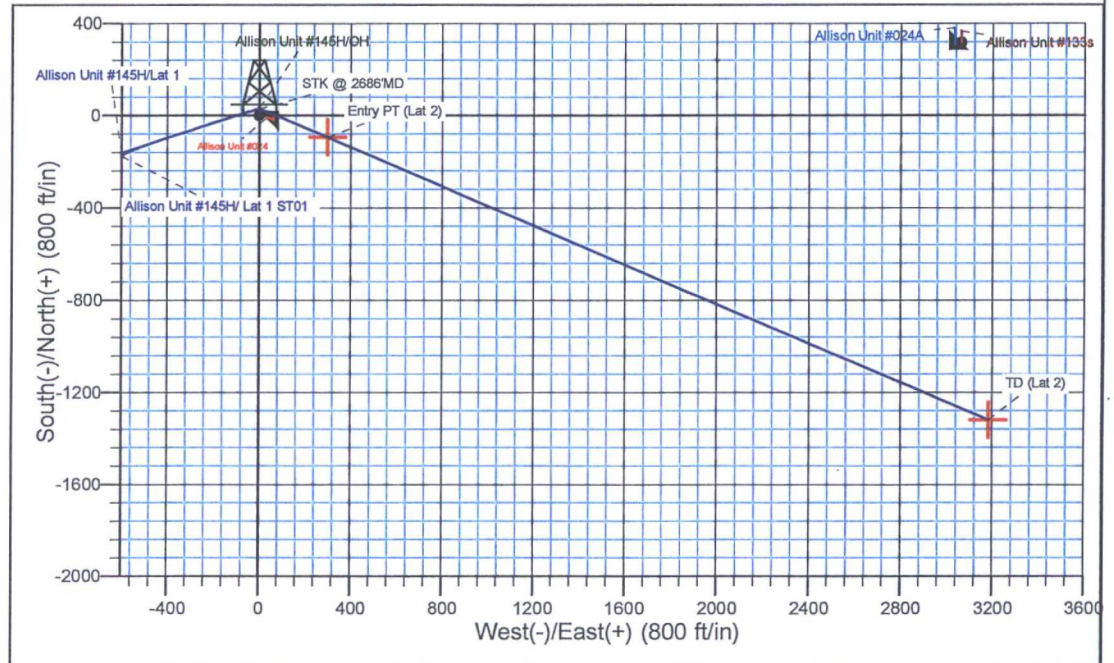
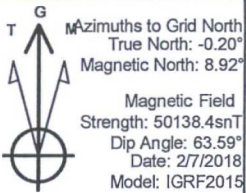
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	2686.00	0.86	0.00	2685.83	28.06	0.00	0.00	0.00	-10.74	
2	3198.68	89.89	113.02	3013.25	-94.83	300.84	17.60	113.02	314.22	
3	6330.26	89.89	113.02	3019.00	-1319.30	3183.11	0.00	0.00	3445.68	TD (Lat 2)

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Entry PT (Lat 2)	3013.25	-94.83	300.84	2179694.470	596086.739	36° 59' 23.005 N	107° 30' 15.592 W	Point
TD (Lat 2)	3019.00	-1319.30	3183.11	2178470.003	598969.000	36° 59' 10.797 N	107° 29' 40.118 W	Point



Created By: Frank Scardino Date: 2/12/2018
 Checked: _____ Date: _____





Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 2

Plan: Design #3

Standard Planning Report - Geographic

12 February, 2018





Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 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 #145H				
Site Position:		Northing:	2,179,789.300 usft	Latitude:	36° 59' 23.953 N
From:	Map	Easting:	595,785.900 usft	Longitude:	107° 30' 19.296 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.20 °

Well	Allison Unit #145H					
Well Position	+N/-S	0.00 ft	Northing:	2,179,789.300 usft	Latitude:	36° 59' 23.953 N
	+E/-W	0.00 ft	Easting:	595,785.900 usft	Longitude:	107° 30' 19.296 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	6,519.00 ft

Wellbore	Lat 2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/7/2018	9.12	63.59	50,138

Design	Design #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	2,686.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	112.51

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
2,686.00	0.86	0.00	2,685.83	28.06	0.00	0.00	0.00	0.00	0.00	
3,198.68	89.89	113.02	3,013.25	-94.83	300.84	17.60	17.37	22.04	113.02	
6,330.26	89.89	113.02	3,019.00	-1,319.30	3,183.11	0.00	0.00	0.00	0.00	TD (Lat 2)



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 2
Design: Design #3

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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
2,686.00	0.86	0.00	2,685.83	28.06	0.00	2,179,817.361	595,785.900	36° 59' 24.231 N	107° 30' 19.295 W
STK @ 2686' MD DLS 17.60° TFO 113.02									
2,700.00	2.27	92.59	2,699.82	28.15	0.28	2,179,817.453	595,786.177	36° 59' 24.232 N	107° 30' 19.292 W
2,725.00	6.57	106.12	2,724.74	27.73	2.15	2,179,817.033	595,788.047	36° 59' 24.227 N	107° 30' 19.269 W
2,750.00	10.96	108.92	2,749.45	26.56	5.77	2,179,815.865	595,791.671	36° 59' 24.216 N	107° 30' 19.224 W
2,775.00	15.35	110.13	2,773.78	24.65	11.13	2,179,813.955	595,797.027	36° 59' 24.197 N	107° 30' 19.158 W
2,800.00	19.74	110.81	2,797.62	22.02	18.18	2,179,811.315	595,804.084	36° 59' 24.170 N	107° 30' 19.071 W
2,825.00	24.14	111.25	2,820.80	18.66	26.90	2,179,807.961	595,812.800	36° 59' 24.137 N	107° 30' 18.964 W
2,850.00	28.54	111.56	2,843.20	14.61	37.22	2,179,803.912	595,823.123	36° 59' 24.097 N	107° 30' 18.837 W
2,875.00	32.94	111.79	2,864.68	9.89	49.09	2,179,799.192	595,834.993	36° 59' 24.049 N	107° 30' 18.691 W
2,900.00	37.33	111.98	2,885.12	4.53	62.44	2,179,793.829	595,848.340	36° 59' 23.996 N	107° 30' 18.526 W
2,911.32	39.33	112.05	2,894.00	1.90	68.95	2,179,791.197	595,854.848	36° 59' 23.970 N	107° 30' 18.446 W
Top Of Coal									
2,925.00	41.73	112.13	2,904.40	-1.45	77.19	2,179,787.854	595,863.085	36° 59' 23.936 N	107° 30' 18.345 W
2,950.00	46.13	112.26	2,922.40	-8.00	93.24	2,179,781.303	595,879.141	36° 59' 23.871 N	107° 30' 18.147 W
2,975.00	50.53	112.37	2,939.01	-15.09	110.51	2,179,774.214	595,896.414	36° 59' 23.800 N	107° 30' 17.935 W
3,000.00	54.93	112.46	2,954.15	-22.67	128.90	2,179,766.630	595,914.801	36° 59' 23.725 N	107° 30' 17.708 W
3,025.00	59.33	112.55	2,967.71	-30.71	148.30	2,179,758.594	595,934.195	36° 59' 23.645 N	107° 30' 17.470 W
3,050.00	63.73	112.63	2,979.63	-39.15	168.58	2,179,750.155	595,954.480	36° 59' 23.560 N	107° 30' 17.220 W
3,075.00	68.13	112.70	2,989.82	-47.94	189.64	2,179,741.361	595,975.539	36° 59' 23.473 N	107° 30' 16.961 W
3,100.00	72.53	112.77	2,998.23	-57.04	211.35	2,179,732.266	595,997.245	36° 59' 23.382 N	107° 30' 16.693 W
3,125.00	76.93	112.83	3,004.82	-66.38	233.57	2,179,722.921	596,019.472	36° 59' 23.289 N	107° 30' 16.420 W
3,150.00	81.33	112.90	3,009.53	-75.92	256.19	2,179,713.383	596,042.088	36° 59' 23.194 N	107° 30' 16.142 W
3,160.94	83.25	112.92	3,011.00	-80.14	266.18	2,179,709.161	596,052.078	36° 59' 23.152 N	107° 30' 16.019 W
Pargin Seam									
3,175.00	85.73	112.96	3,012.35	-85.59	279.06	2,179,703.708	596,064.961	36° 59' 23.097 N	107° 30' 15.860 W
3,198.68	89.89	113.02	3,013.25	-94.83	300.84	2,179,694.469	596,086.738	36° 59' 23.005 N	107° 30' 15.592 W
Entry PT (Lat 2)									
3,200.00	89.89	113.02	3,013.26	-95.35	302.06	2,179,693.953	596,087.954	36° 59' 23.000 N	107° 30' 15.577 W
3,300.00	89.89	113.02	3,013.44	-134.45	394.09	2,179,654.852	596,179.993	36° 59' 22.610 N	107° 30' 14.444 W
3,400.00	89.89	113.02	3,013.62	-173.55	486.13	2,179,615.752	596,272.031	36° 59' 22.221 N	107° 30' 13.311 W
3,500.00	89.89	113.02	3,013.81	-212.65	578.17	2,179,576.651	596,364.070	36° 59' 21.831 N	107° 30' 12.179 W
3,600.00	89.89	113.02	3,013.99	-251.75	670.21	2,179,537.551	596,456.108	36° 59' 21.441 N	107° 30' 11.046 W
3,700.00	89.89	113.02	3,014.17	-290.85	762.25	2,179,498.450	596,548.147	36° 59' 21.051 N	107° 30' 9.913 W
3,800.00	89.89	113.02	3,014.36	-329.95	854.29	2,179,459.350	596,640.185	36° 59' 20.661 N	107° 30' 8.780 W
3,900.00	89.89	113.02	3,014.54	-369.05	946.33	2,179,420.249	596,732.223	36° 59' 20.272 N	107° 30' 7.647 W
4,000.00	89.89	113.02	3,014.72	-408.15	1,038.36	2,179,381.149	596,824.262	36° 59' 19.882 N	107° 30' 6.515 W
4,100.00	89.89	113.02	3,014.91	-447.25	1,130.40	2,179,342.048	596,916.300	36° 59' 19.492 N	107° 30' 5.382 W
4,200.00	89.89	113.02	3,015.09	-486.35	1,222.44	2,179,302.947	597,008.339	36° 59' 19.102 N	107° 30' 4.249 W
4,300.00	89.89	113.02	3,015.27	-525.45	1,314.48	2,179,263.847	597,100.377	36° 59' 18.712 N	107° 30' 3.116 W
4,400.00	89.89	113.02	3,015.46	-564.56	1,406.52	2,179,224.746	597,192.416	36° 59' 18.323 N	107° 30' 1.983 W
4,500.00	89.89	113.02	3,015.64	-603.66	1,498.56	2,179,185.646	597,284.454	36° 59' 17.933 N	107° 30' 0.851 W
4,600.00	89.89	113.02	3,015.83	-642.76	1,590.60	2,179,146.545	597,376.492	36° 59' 17.543 N	107° 29' 59.718 W
4,700.00	89.89	113.02	3,016.01	-681.86	1,682.63	2,179,107.445	597,468.531	36° 59' 17.153 N	107° 29' 58.585 W
4,800.00	89.89	113.02	3,016.19	-720.96	1,774.67	2,179,068.344	597,560.569	36° 59' 16.763 N	107° 29' 57.452 W
4,900.00	89.89	113.02	3,016.38	-760.06	1,866.71	2,179,029.243	597,652.608	36° 59' 16.373 N	107° 29' 56.319 W
5,000.00	89.89	113.02	3,016.56	-799.16	1,958.75	2,178,990.142	597,744.646	36° 59' 15.984 N	107° 29' 55.187 W
5,100.00	89.89	113.02	3,016.74	-838.26	2,050.79	2,178,951.042	597,836.685	36° 59' 15.594 N	107° 29' 54.054 W
5,200.00	89.89	113.02	3,016.93	-877.36	2,142.83	2,178,911.941	597,928.723	36° 59' 15.204 N	107° 29' 52.921 W
5,300.00	89.89	113.02	3,017.11	-916.46	2,234.87	2,178,872.841	598,020.762	36° 59' 14.814 N	107° 29' 51.788 W
5,400.00	89.89	113.02	3,017.29	-955.56	2,326.91	2,178,833.740	598,112.800	36° 59' 14.424 N	107° 29' 50.656 W
5,500.00	89.89	113.02	3,017.48	-994.66	2,418.94	2,178,794.639	598,204.838	36° 59' 14.034 N	107° 29' 49.523 W
5,600.00	89.89	113.02	3,017.66	-1,033.76	2,510.98	2,178,755.539	598,296.877	36° 59' 13.645 N	107° 29' 48.390 W
5,700.00	89.89	113.02	3,017.84	-1,072.86	2,603.02	2,178,716.438	598,388.915	36° 59' 13.255 N	107° 29' 47.257 W



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 2
Design: Design #3

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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
5,800.00	89.89	113.02	3,018.03	-1,111.96	2,695.06	2,178,677.338	598,480.954	36° 59' 12.865 N	107° 29' 46.125 W
5,900.00	89.89	113.02	3,018.21	-1,151.06	2,787.10	2,178,638.237	598,572.992	36° 59' 12.475 N	107° 29' 44.992 W
6,000.00	89.89	113.02	3,018.39	-1,190.17	2,879.14	2,178,599.137	598,665.031	36° 59' 12.085 N	107° 29' 43.859 W
6,100.00	89.89	113.02	3,018.58	-1,229.27	2,971.18	2,178,560.036	598,757.069	36° 59' 11.695 N	107° 29' 42.726 W
6,200.00	89.89	113.02	3,018.76	-1,268.37	3,063.21	2,178,520.936	598,849.107	36° 59' 11.305 N	107° 29' 41.594 W
6,300.00	89.89	113.02	3,018.94	-1,307.47	3,155.25	2,178,481.835	598,941.146	36° 59' 10.915 N	107° 29' 40.461 W
6,330.26	89.89	113.02	3,019.00	-1,319.30	3,183.11	2,178,470.002	598,969.000	36° 59' 10.797 N	107° 29' 40.118 W
TD (Lat 2)									

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
Entry PT (Lat 2) - plan hits target center - Point	0.00	0.00	3,013.25	-94.83	300.84	2,179,694.471	596,086.739	36° 59' 23.005 N	107° 30' 15.592 W
TD (Lat 2) - plan hits target center - Point	0.00	0.01	3,019.00	-1,319.30	3,183.11	2,178,470.002	598,969.000	36° 59' 10.797 N	107° 29' 40.118 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,911.32	2,894.00	Top Of Coal			
3,160.94	3,011.00	Pargin Seam			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,686.00	2,685.83	28.06	0.00	STK @ 2686' MD DLS 17.60° TFO 113.02



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 2

Design #3

Anticollision Report

12 February, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 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 561.05 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	2/12/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,686.00	OH (OH)	MWD	MWD - Standard	
2,686.00	6,330.26	Design #3 (Lat 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 #145H						
Allison Unit #145H - Lat 1 - Design #1	3,000.00	2,875.00	190.36	187.79	73.830	CC, ES
Allison Unit #145H - Lat 1 - Design #1	3,200.00	2,866.94	384.87	378.24	58.052	SF
Allison Unit #145H - Lat 1 ST01 - Design #1	3,000.00	2,875.00	190.36	187.79	73.830	CC, ES
Allison Unit #145H - Lat 1 ST01 - Design #1	3,200.00	2,866.94	384.87	378.24	58.052	SF
Allison Unit #145H - OH - OH	3,000.00	2,953.40	140.18	138.02	65.144	CC, ES
Allison Unit #145H - OH - OH	3,200.00	2,955.00	333.14	327.00	54.293	SF
Allison Unit #145H Offsets						
Allison Unit #009 - Allison Unit #009 - Allison Unit #009						Out of range
Allison Unit #009m - Allison Unit #009m - Allison Unit #0						Out of range
Allison Unit #009R - Allison Unit #009R - Allison Unit #00						Out of range
Allison Unit #013m - Allison Unit #013m - Allison Unit #0						Out of range
Allison Unit #020m - Allison Unit #020m - Allison Unit #0						Out of range
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,878.34	2,867.69	21.85	2.42	1.125	Level 2, CC, ES, SF
Allison Unit #024A - Allison Unit #024A - Allison Unit #02						Out of range
Allison Unit #039m - Allison Unit #039m - Allison Unit #0						Out of range
Allison Unit #039N - Wellbore #1 - Wellbore #1						Out of range
Allison Unit #061 - Allison Unit #061 - Allison Unit #061						Out of range
Allison Unit #061m - Allison Unit #061m - Allison Unit #0						Out of range
Allison Unit #061N - Allison Unit #061N - Allison Unit #06						Out of range
Allison Unit #112s - Allison Unit #112s - Wellbore #1						Out of range
Allison Unit #125s - Allison Unit #125s - Allison Unit #125						Out of range
Allison Unit #133s - Allison Unit #133s - Allison Unit #133						Out of range
Allison Unit #134s - Allison Unit #134s - Allison Unit #134						Out of range
Allison Unit 057N - Allison Unit #057N - Allison Unit #057						Out of range

Offset Design	Allison Unit #145H - Allison Unit #145H - Lat 1 - Design #1											Offset Site Error:	0.00 ft
Survey Program:	156-MWD, 2726-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
2,686.00	2,685.82	2,685.98	2,685.81	0.00	0.00	-156.04	28.06	0.00	1.59				
2,700.00	2,699.82	2,700.00	2,699.82	0.05	0.06	-159.40	28.27	0.00	0.30	0.19	0.11	2.650	

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Allison Unit #145H - Allison Unit #145H - Lat 1 - Design #1													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2726-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		
2,800.00	2,797.62	2,792.94	2,792.19	0.84	0.43	169.56	27.30	-7.32	26.60	24.75	1.86	14.309		
2,900.00	2,885.12	2,850.00	2,846.13	1.10	0.77	160.66	22.36	-24.97	97.36	94.27	3.09	31.546		
3,000.00	2,954.15	2,875.00	2,868.41	1.57	0.89	137.45	19.14	-35.84	190.36	187.79	2.58	73.830 CC, ES		
3,100.00	2,998.23	2,875.00	2,868.41	4.11	0.89	28.63	19.14	-35.84	289.41	285.06	4.35	66.538		
3,200.00	3,013.26	2,866.94	2,861.33	7.14	0.85	9.12	20.25	-32.13	384.87	378.24	6.63	58.052 SF		
3,300.00	3,013.44	2,850.00	2,846.13	10.45	0.77	6.69	22.36	-24.97	477.69	469.54	8.15	58.578		



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - Lat 1 ST01 - Design #1													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2726-MWD, 3400-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	
2,686.00	2,685.82	2,685.98	2,685.81	0.00	0.00	-156.04	28.06	0.00	1.59					
2,700.00	2,699.82	2,700.00	2,699.82	0.05	0.06	-159.40	28.27	0.00	0.30	0.19	0.11	2.650		
2,800.00	2,797.62	2,792.94	2,792.19	0.84	0.43	169.56	27.30	-7.32	26.60	24.75	1.86	14.309		
2,900.00	2,885.12	2,850.00	2,846.13	1.10	0.77	160.66	22.36	-24.97	97.36	94.27	3.09	31.546		
3,000.00	2,954.15	2,875.00	2,868.41	1.57	0.89	137.45	19.14	-35.84	190.36	187.79	2.58	73.830 CC, ES		
3,100.00	2,998.23	2,875.00	2,868.41	4.11	0.89	28.63	19.14	-35.84	289.41	285.06	4.35	66.538		
3,200.00	3,013.26	2,866.94	2,861.33	7.14	0.85	9.12	20.25	-32.13	384.87	378.24	6.63	58.052 SF		
3,300.00	3,013.44	2,850.00	2,846.13	10.45	0.77	6.69	22.36	-24.97	477.69	469.54	8.15	58.578		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - OH - OH													Offset Site Error:	0.00 ft
Survey Program:		156-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)	Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
2,686.00	2,685.82	2,685.98	2,685.81	0.00	0.00	-156.04	28.06	0.00	1.59					
2,700.00	2,699.82	2,700.00	2,699.82	0.05	0.06	-159.40	28.27	0.00	0.30	0.19	0.11	2.650		
2,800.00	2,797.62	2,797.68	2,797.49	0.84	0.46	-177.49	29.80	0.00	19.78	18.59	1.19	16.630		
2,900.00	2,885.12	2,884.87	2,884.67	1.10	0.82	-178.52	31.23	0.00	67.91	66.13	1.78	38.112		
3,000.00	2,954.15	2,953.40	2,953.19	1.57	1.11	-178.82	32.40	0.00	140.18	138.02	2.15	65.144	CC, ES	
3,100.00	2,998.23	2,955.00	2,954.79	4.11	1.12	-178.54	32.43	0.00	233.58	229.57	4.00	58.348		
3,200.00	3,013.26	2,955.00	2,954.79	7.14	1.12	0.50	32.43	0.00	333.14	327.00	6.14	54.293	SF	
3,300.00	3,013.44	2,955.00	2,954.79	10.45	1.12	0.50	32.43	0.00	431.97	424.13	7.84	55.096		
3,400.00	3,013.62	2,955.00	2,954.79	13.93	1.12	0.50	32.43	0.00	531.24	521.80	9.44	56.297		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #3	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #024 - Allison Unit #024 - Allison Unit #024													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	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	95.57	-5.99	61.37	61.66					
100.00	100.00	99.90	99.90	0.19	0.18	96.11	-6.15	61.43	61.78	61.42	0.36	171.444		
200.00	199.99	199.88	199.88	0.50	0.60	97.52	-6.53	61.55	62.09	61.00	1.09	57.029		
300.00	299.98	300.12	300.11	0.92	0.95	99.30	-7.15	61.45	62.27	60.40	1.86	33.443		
400.00	399.97	400.15	400.14	1.34	1.26	101.19	-7.87	61.08	62.26	59.67	2.59	24.045		
500.00	499.97	500.00	499.99	1.76	1.59	103.06	-8.54	60.61	62.22	58.88	3.34	18.624		
507.76	507.73	507.92	507.91	1.79	1.62	103.21	-8.60	60.57	62.22	58.82	3.40	18.287		
600.00	599.96	599.71	599.70	2.18	1.95	105.04	-9.41	60.42	62.57	58.44	4.12	15.179		
700.00	699.95	699.77	699.75	2.59	2.34	106.94	-10.41	60.51	63.26	58.34	4.92	12.854		
800.00	799.95	799.69	799.66	3.00	2.72	108.57	-11.33	60.62	63.95	58.23	5.72	11.177		
900.00	899.94	899.70	899.68	3.41	3.11	109.94	-12.18	60.77	64.65	58.13	6.52	9.916		
1,000.00	999.94	999.51	999.48	3.82	3.48	111.09	-13.03	61.05	65.43	58.13	7.30	8.964		
1,100.00	1,099.94	1,099.60	1,099.57	4.24	3.83	112.01	-13.82	61.41	66.24	58.17	8.07	8.209		
1,200.00	1,199.94	1,199.78	1,199.74	4.65	4.23	112.90	-14.57	61.56	66.83	57.95	8.87	7.531		
1,300.00	1,299.94	1,299.79	1,299.75	5.06	4.64	113.83	-15.31	61.55	67.28	57.58	9.70	6.937		
1,400.00	1,399.94	1,399.99	1,399.95	5.48	5.01	114.78	-16.02	61.37	67.59	57.10	10.49	6.446		
1,500.00	1,499.93	1,499.92	1,499.87	5.89	5.37	115.68	-16.64	61.12	67.81	56.55	11.26	6.023		
1,600.00	1,599.93	1,600.03	1,599.98	6.31	5.72	116.55	-17.21	60.85	68.02	56.00	12.03	5.655		
1,700.00	1,699.93	1,699.97	1,699.92	6.73	6.07	117.57	-17.73	60.55	68.31	55.52	12.79	5.340		
1,800.00	1,799.93	1,800.30	1,800.25	7.15	6.31	118.74	-18.05	60.12	68.56	55.11	13.45	5.096		
1,900.00	1,899.92	1,900.52	1,900.46	7.57	6.42	120.08	-18.12	59.35	68.59	54.60	13.99	4.904		
2,000.00	1,999.90	2,001.06	2,001.00	7.99	6.55	121.42	-17.66	58.22	68.23	53.69	14.53	4.695		
2,100.00	2,099.89	2,101.20	2,101.12	8.40	6.72	122.66	-16.78	56.74	67.40	52.28	15.12	4.459		
2,200.00	2,199.88	2,201.24	2,201.14	8.82	6.90	123.95	-15.90	55.07	66.40	50.69	15.71	4.226		
2,300.00	2,299.87	2,300.98	2,300.87	9.23	7.09	125.30	-15.18	53.48	65.53	49.22	16.31	4.017		
2,400.00	2,399.86	2,401.00	2,400.88	9.65	7.28	126.75	-14.68	51.92	64.81	47.89	16.92	3.830		
2,500.00	2,499.85	2,501.24	2,501.10	10.06	7.49	128.24	-14.08	50.14	63.85	46.30	17.55	3.638		
2,600.00	2,599.84	2,601.20	2,601.04	10.47	7.73	129.81	-13.37	48.22	62.77	44.58	18.20	3.450		
2,700.00	2,699.82	2,701.26	2,701.07	10.86	7.98	130.02	-12.62	46.27	61.47	42.64	18.83	3.264		
2,800.00	2,797.62	2,798.69	2,798.48	10.93	8.25	133.25	-11.73	44.30	62.68	42.52	19.16	2.228		
2,878.34	2,867.48	2,867.69	2,867.46	11.05	8.44	89.92	-11.08	42.70	21.85	2.42	19.43	1.125	Level 2, CC, ES, SF	
2,900.00	2,885.12	2,884.96	2,884.73	11.09	8.49	114.68	-10.92	42.24	25.43	5.94	19.49	1.305	Level 3	
3,000.00	2,954.15	2,951.68	2,951.42	11.70	8.67	154.68	-10.37	40.34	89.45	69.53	19.92	4.491		
3,100.00	2,998.23	2,992.88	2,992.60	13.31	8.79	153.85	-10.15	39.07	178.63	158.43	20.19	8.847		
3,200.00	3,013.26	3,004.81	3,004.52	15.88	8.82	71.45	-10.11	38.69	276.95	256.66	20.28	13.653		
3,300.00	3,013.44	3,001.93	3,001.64	19.00	8.81	65.60	-10.12	38.79	376.62	356.34	20.28	18.571		
3,400.00	3,013.62	2,999.05	2,998.76	22.44	8.81	60.25	-10.13	38.88	476.41	456.13	20.28	23.497		



Anticollision Report



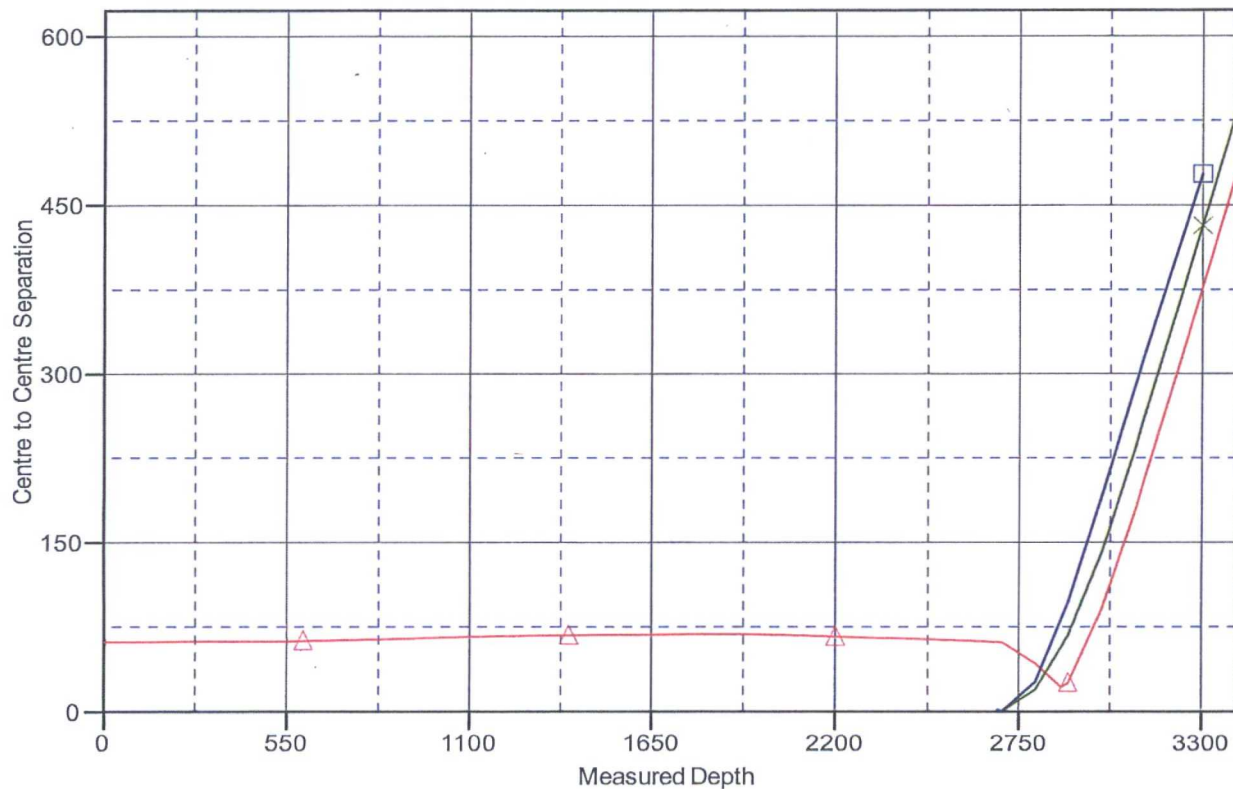
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 2
Reference Design: Design #3

Local Co-ordinate Reference:
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND

on Unit #024, Allison Unit #024, Allison Unit #024 V0
on Unit #145H, Lat 1, Design #1 V0

✕ Allison Unit #145H, OH, OH V0
□ Allison Unit #145H, Lat 1 ST01, Design #1 V0



Anticollision Report



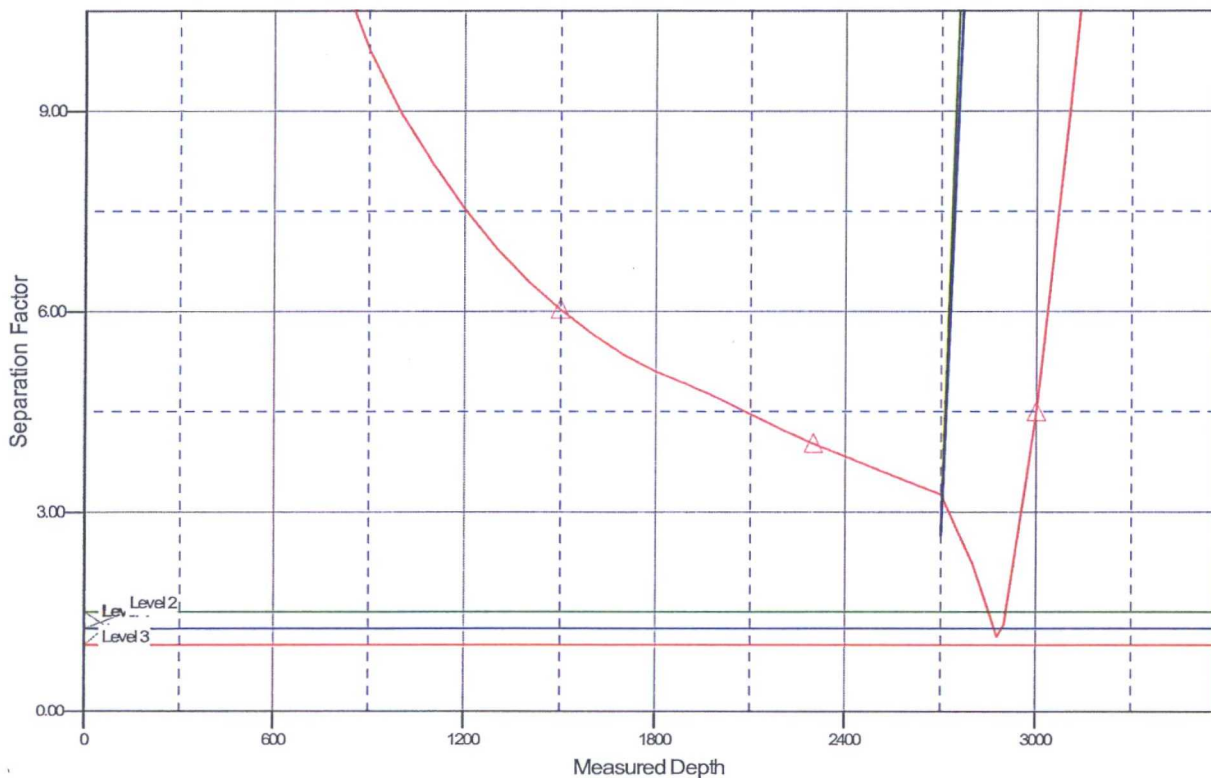
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 2
Reference Design: Design #3

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND

on Unit #024, Allison Unit #024, Allison Unit #024 V0 Allison Unit #145H, OH, OH V0
on Unit #145H, Lat 1, Design #1 V0 Allison Unit #145H, Lat 1 ST01, Design #1 V0



HILCORP ENERGY COMPANY
ALLISON UNIT #145 Lat 2 ST01
SAN JUAN BASIN NM
6519' GL + 15' KB



WELL DETAILS: Allison Unit #145H

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude
0.00	0.00	2179789.300	6519.00	595785.900	36° 59' 23.953 N	107° 30' 19.296 W

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

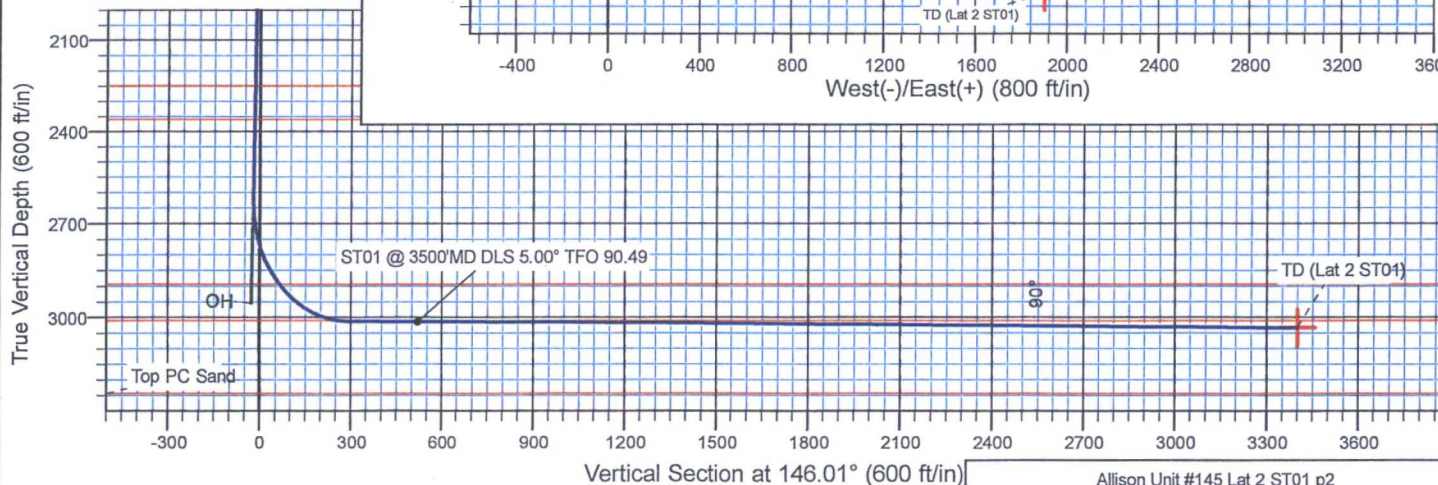
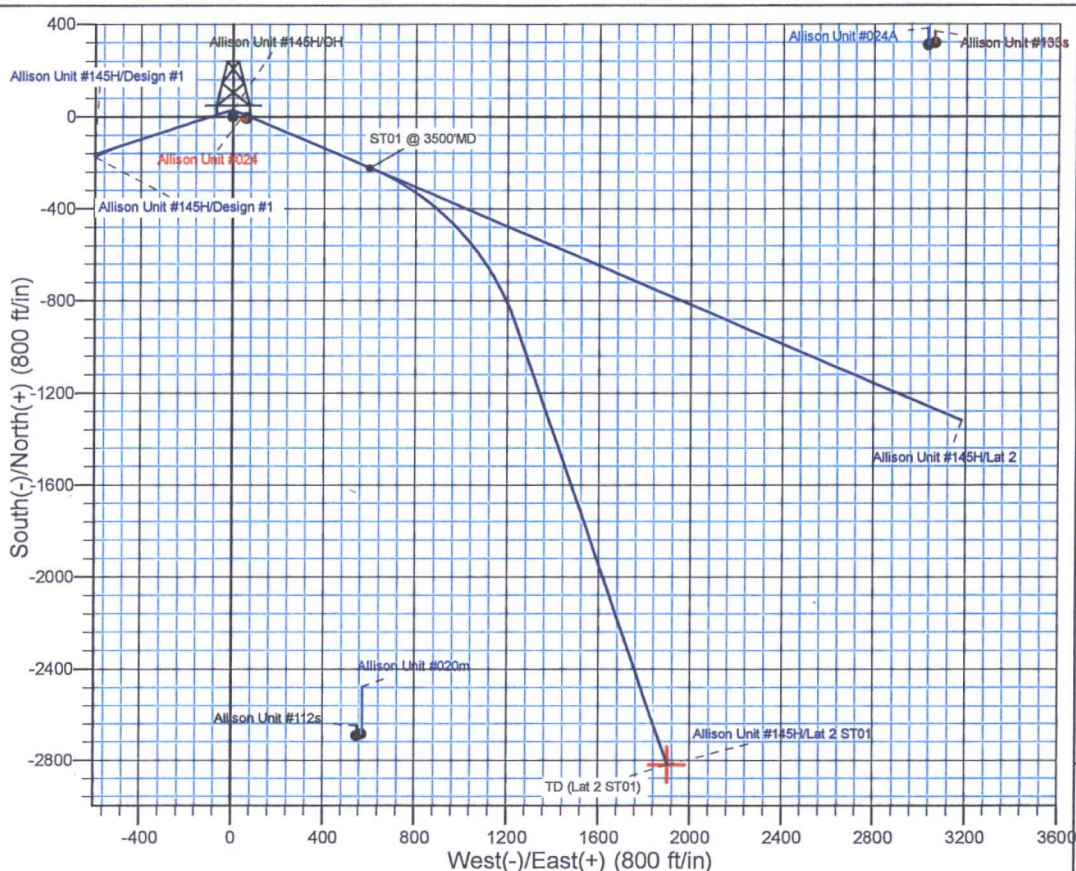
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	3500.00	89.89	113.01	3013.74	-222.38	600.73	0.00	0.00	520.23	
2	4456.83	89.56	160.86	3018.56	-901.28	1235.26	5.00	90.49	1437.87	
3	6487.21	89.56	160.86	3034.00	-2819.31	1901.10	0.00	0.00	3400.39	TD (Lat 2 ST01)

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD (Lat 2 ST01)	3034.00	-2819.31	1901.10	2176970.000	597687.000	36° 58' 56.010 N	107° 29' 55.985 W	Point



Allison Unit #145 Lat 2 ST01 p2

Created By: Frank Scardino Date: 2/7/2018
Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 2 ST01

Plan: Design #2

Standard Planning Report - Geographic

07 February, 2018





Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 2 ST01		
Design:	Design #2		

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 #145H				
Site Position:		Northing:	2,179,789.300 usft	Latitude:	36° 59' 23.953 N
From:	Map	Easting:	595,785.900 usft	Longitude:	107° 30' 19.296 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.20 °

Well	Allison Unit #145H					
Well Position	+N/-S	0.00 ft	Northing:	2,179,789.300 usft	Latitude:	36° 59' 23.953 N
	+E/-W	0.00 ft	Easting:	595,785.900 usft	Longitude:	107° 30' 19.296 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	6,519.00 ft

Wellbore	Lat 2 ST01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/7/2018	9.12	63.59	50,138

Design	Design #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	3,500.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	146.01

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
3,500.00	89.89	113.01	3,013.74	-222.38	600.73	0.00	0.00	0.00	0.00	
4,456.83	89.56	160.86	3,018.56	-901.28	1,235.26	5.00	-0.03	5.00	90.49	
6,487.21	89.56	160.86	3,034.00	-2,819.31	1,901.10	0.00	0.00	0.00	0.00	TD (Lat 2 ST01)



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 2 ST01
Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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
3,500.00	89.89	113.01	3,013.74	-222.38	600.73	2,179,566.921	596,386.624	36° 59' 21.734 N	107° 30' 11.901 W
ST01 @ 3500'MD DLS 5.00° TFO 90.49									
3,600.00	89.85	118.01	3,013.97	-265.44	690.94	2,179,523.861	596,476.842	36° 59' 21.305 N	107° 30' 10.791 W
3,700.00	89.81	123.01	3,014.27	-316.20	777.07	2,179,473.103	596,562.965	36° 59' 20.800 N	107° 30' 9.731 W
3,800.00	89.77	128.01	3,014.63	-374.27	858.44	2,179,415.031	596,644.336	36° 59' 20.223 N	107° 30' 8.731 W
3,900.00	89.73	133.01	3,015.07	-439.21	934.44	2,179,350.090	596,720.336	36° 59' 19.578 N	107° 30' 7.797 W
4,000.00	89.70	138.01	3,015.57	-510.53	1,004.49	2,179,278.771	596,790.386	36° 59' 18.871 N	107° 30' 6.936 W
4,100.00	89.66	143.01	3,016.13	-587.68	1,068.06	2,179,201.620	596,853.954	36° 59' 18.106 N	107° 30' 6.156 W
4,200.00	89.63	148.01	3,016.75	-670.08	1,124.66	2,179,119.221	596,910.556	36° 59' 17.289 N	107° 30' 5.462 W
4,300.00	89.60	153.01	3,017.42	-757.10	1,173.86	2,179,032.203	596,959.760	36° 59' 16.427 N	107° 30' 4.859 W
4,400.00	89.58	158.01	3,018.14	-848.07	1,215.30	2,178,941.228	597,001.194	36° 59' 15.526 N	107° 30' 4.353 W
4,456.83	89.56	160.86	3,018.56	-901.28	1,235.26	2,178,888.025	597,021.155	36° 59' 14.999 N	107° 30' 4.109 W
4,500.00	89.56	160.86	3,018.89	-942.06	1,249.41	2,178,847.245	597,035.311	36° 59' 14.595 N	107° 30' 3.936 W
4,600.00	89.56	160.86	3,019.65	-1,036.52	1,282.21	2,178,752.779	597,068.105	36° 59' 13.660 N	107° 30' 3.536 W
4,700.00	89.56	160.86	3,020.41	-1,130.99	1,315.00	2,178,658.312	597,100.900	36° 59' 12.725 N	107° 30' 3.136 W
4,800.00	89.56	160.86	3,021.17	-1,225.46	1,347.80	2,178,563.846	597,133.694	36° 59' 11.789 N	107° 30' 2.736 W
4,900.00	89.56	160.86	3,021.93	-1,319.92	1,380.59	2,178,469.379	597,166.488	36° 59' 10.854 N	107° 30' 2.335 W
5,000.00	89.56	160.86	3,022.69	-1,414.39	1,413.39	2,178,374.913	597,199.282	36° 59' 9.919 N	107° 30' 1.935 W
5,100.00	89.56	160.86	3,023.45	-1,508.86	1,446.18	2,178,280.446	597,232.076	36° 59' 8.984 N	107° 30' 1.535 W
5,200.00	89.56	160.86	3,024.21	-1,603.32	1,478.97	2,178,185.980	597,264.870	36° 59' 8.048 N	107° 30' 1.135 W
5,300.00	89.56	160.86	3,024.97	-1,697.79	1,511.77	2,178,091.513	597,297.665	36° 59' 7.113 N	107° 30' 0.735 W
5,400.00	89.56	160.86	3,025.73	-1,792.26	1,544.56	2,177,997.047	597,330.459	36° 59' 6.178 N	107° 30' 0.335 W
5,500.00	89.56	160.86	3,026.49	-1,886.72	1,577.36	2,177,902.580	597,363.253	36° 59' 5.243 N	107° 29' 59.935 W
5,600.00	89.56	160.86	3,027.25	-1,981.19	1,610.15	2,177,808.114	597,396.047	36° 59' 4.307 N	107° 29' 59.535 W
5,700.00	89.56	160.86	3,028.01	-2,075.66	1,642.95	2,177,713.647	597,428.841	36° 59' 3.372 N	107° 29' 59.134 W
5,800.00	89.56	160.86	3,028.77	-2,170.12	1,675.74	2,177,619.181	597,461.636	36° 59' 2.437 N	107° 29' 58.734 W
5,900.00	89.56	160.86	3,029.53	-2,264.59	1,708.53	2,177,524.714	597,494.430	36° 59' 1.502 N	107° 29' 58.334 W
6,000.00	89.56	160.86	3,030.30	-2,359.06	1,741.33	2,177,430.248	597,527.224	36° 59' 0.566 N	107° 29' 57.934 W
6,100.00	89.56	160.86	3,031.06	-2,453.52	1,774.12	2,177,335.781	597,560.018	36° 58' 59.631 N	107° 29' 57.534 W
6,200.00	89.56	160.86	3,031.82	-2,547.99	1,806.92	2,177,241.315	597,592.812	36° 58' 58.696 N	107° 29' 57.134 W
6,300.00	89.56	160.86	3,032.58	-2,642.46	1,839.71	2,177,146.848	597,625.606	36° 58' 57.761 N	107° 29' 56.734 W
6,400.00	89.56	160.86	3,033.34	-2,736.92	1,872.50	2,177,052.382	597,658.401	36° 58' 56.825 N	107° 29' 56.334 W
6,487.21	89.56	160.86	3,034.00	-2,819.31	1,901.10	2,176,970.000	597,687.000	36° 58' 56.010 N	107° 29' 55.985 W
TD (Lat 2 ST01)									

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 (Lat 2 ST01)	0.00	0.00	3,034.00	-2,819.31	1,901.10	2,176,970.000	597,687.000	36° 58' 56.010 N	107° 29' 55.985 W
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,500.00	3,013.74	-222.38	600.73	ST01 @ 3500'MD DLS 5.00° TFO 90.49



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 2 ST01

Design #2

Anticollision Report

07 February, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference	Design #2		
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 1,266.90 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	2/7/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,629.30	OH (OH)	MWD	MWD - Standard	
2,629.30	3,500.00	Design #2 (Lat 2)	MWD	MWD - Standard	
3,500.00	6,487.21	Design #2 (Lat 2 ST01)	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 #145H						
Allison Unit #145H - Lat 1 - Design #1	3,000.00	2,865.93	210.13	207.65	84.980	CC, ES
Allison Unit #145H - Lat 1 - Design #1	3,300.00	2,850.00	500.73	492.37	59.889	SF
Allison Unit #145H - Lat 1 ST01 - Design #1	3,000.00	2,865.93	210.13	207.65	84.980	CC, ES
Allison Unit #145H - Lat 1 ST01 - Design #1	3,300.00	2,850.00	500.73	492.37	59.889	SF
Allison Unit #145H - Lat 2 - Design #2	3,900.00	3,891.93	69.11	45.83	2.969	CC, ES, SF
Allison Unit #145H - OH - OH	3,000.00	2,944.30	166.37	163.37	55.359	CC, ES
Allison Unit #145H - OH - OH	3,200.00	2,955.00	357.17	350.50	53.520	SF
Allison Unit #145H Offsets						
Allison Unit #009 - Allison Unit #009 - Allison Unit #009						Out of range
Allison Unit #009m - Allison Unit #009m - Allison Unit #0						Out of range
Allison Unit #009R - Allison Unit #009R - Allison Unit #00						Out of range
Allison Unit #013m - Allison Unit #013m - Allison Unit #0						Out of range
Allison Unit #020m - Allison Unit #020m - Allison Unit #0	5,867.36	3,043.58	1,190.74	1,100.33	13.170	CC, ES
Allison Unit #020m - Allison Unit #020m - Allison Unit #0	5,900.00	3,042.75	1,191.19	1,100.50	13.134	SF
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,838.67	2,828.70	21.20	2.08	1.109	Level 2, CC, ES, SF
Allison Unit #024A - Allison Unit #024A - Allison Unit #02						Out of range
Allison Unit #039m - Allison Unit #039m - Allison Unit #0	6,487.21	3,056.04	1,248.12	1,185.51	19.935	CC, ES, SF
Allison Unit #039N - Wellbore #1 - Wellbore #1						Out of range
Allison Unit #061 - Allison Unit #061 - Allison Unit #061						Out of range
Allison Unit #061m - Allison Unit #061m - Allison Unit #0						Out of range
Allison Unit #061N - Allison Unit #061N - Allison Unit #06						Out of range
Allison Unit #112s - Allison Unit #112s - Wellbore #1	5,882.53	2,967.00	1,219.36	1,128.80	13.464	CC
Allison Unit #112s - Allison Unit #112s - Wellbore #1	5,900.00	2,967.00	1,219.49	1,128.76	13.441	ES
Allison Unit #112s - Allison Unit #112s - Wellbore #1	6,000.00	2,967.00	1,225.01	1,133.62	13.404	SF
Allison Unit #125s - Allison Unit #125s - Allison Unit #125						Out of range
Allison Unit #133s - Allison Unit #133s - Allison Unit #133						Out of range
Allison Unit #134s - Allison Unit #134s - Allison Unit #134						Out of range
Allison Unit 057N - Allison Unit #057N - Allison Unit #057						Out of range

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 #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 2 ST01
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H - Allison Unit #145H - Lat 1 - Design #1													Offset Site Error: 0.00 ft
Survey Program: 156-MWD, 2726-MWD													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	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)			
2,629.30	2,629.12	2,629.29	2,629.12	0.00	0.00	-164.63	27.22	0.00	0.80				
2,700.00	2,699.46	2,699.60	2,699.42	0.38	0.29	-175.53	28.27	0.00	6.53	5.89	0.64	10.204	
2,800.00	2,794.40	2,787.33	2,786.71	0.86	0.57	175.01	27.60	-6.14	43.28	41.35	1.92	22.488	
2,900.00	2,878.23	2,841.72	2,838.54	0.66	0.84	166.60	23.28	-21.78	117.09	114.16	2.93	39.937	
3,000.00	2,945.23	2,865.93	2,860.44	2.41	0.96	151.62	20.38	-31.68	210.13	207.65	2.47	84.980 CC, ES	
3,100.00	2,990.84	2,875.00	2,868.41	4.89	1.00	51.59	19.14	-35.84	309.38	304.69	4.69	65.971	
3,200.00	3,011.94	2,862.33	2,857.24	7.91	0.94	10.27	20.85	-30.10	406.98	400.25	6.73	60.486	
3,300.00	3,013.37	2,850.00	2,846.13	11.24	0.89	6.64	22.36	-24.97	500.73	492.37	8.36	59.889 SF	
3,400.00	3,013.56	2,836.41	2,833.64	14.75	0.81	5.11	23.84	-19.85	595.50	585.69	9.81	60.717	
3,500.00	3,013.74	2,825.00	2,822.95	18.39	0.76	4.07	24.94	-15.98	691.30	680.12	11.18	61.832	
3,600.00	3,013.97	2,825.00	2,822.95	20.68	0.76	21.82	24.94	-15.98	787.75	776.01	11.74	67.097	
3,700.00	3,014.27	2,812.08	2,810.68	22.27	0.69	35.46	26.02	-12.10	883.94	871.55	12.38	71.379	
3,800.00	3,014.63	2,800.00	2,799.05	24.26	0.63	45.84	26.87	-8.95	979.67	966.39	13.28	73.782	
3,900.00	3,015.07	2,800.00	2,799.05	26.52	0.63	55.09	26.87	-8.95	1,074.18	1,059.80	14.38	74.681	
4,000.00	3,015.57	2,800.00	2,799.05	28.95	0.63	61.84	26.87	-8.95	1,167.36	1,151.77	15.59	74.892	
4,100.00	3,016.13	2,800.00	2,799.05	31.43	0.63	66.79	26.87	-8.95	1,258.86	1,242.05	16.81	74.882	

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - Lat 1 ST01 - Design #1													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2726-MWD, 3400-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	
2,629.30	2,629.12	2,629.29	2,629.12	0.00	0.00	-164.63	27.22	0.00	0.80					
2,700.00	2,699.46	2,699.60	2,699.42	0.38	0.29	-175.53	28.27	0.00	6.53	5.89	0.64	10.204		
2,800.00	2,794.40	2,787.33	2,786.71	0.86	0.57	175.01	27.60	-6.14	43.28	41.35	1.92	22.488		
2,900.00	2,878.23	2,841.72	2,838.54	0.66	0.84	166.60	23.28	-21.78	117.09	114.16	2.93	39.937		
3,000.00	2,945.23	2,865.93	2,860.44	2.41	0.96	151.62	20.38	-31.68	210.13	207.65	2.47	84.980 CC, ES		
3,100.00	2,990.84	2,875.00	2,868.41	4.89	1.00	51.59	19.14	-35.84	309.38	304.69	4.69	65.971		
3,200.00	3,011.94	2,862.33	2,857.24	7.91	0.94	10.27	20.85	-30.10	406.98	400.25	6.73	60.486		
3,300.00	3,013.37	2,850.00	2,846.13	11.24	0.89	6.64	22.36	-24.97	500.73	492.37	8.36	59.889 SF		
3,400.00	3,013.56	2,836.41	2,833.64	14.75	0.81	5.11	23.84	-19.85	595.50	585.69	9.81	60.717		
3,500.00	3,013.74	2,825.00	2,822.95	18.39	0.76	4.07	24.94	-15.98	691.30	680.12	11.18	61.832		
3,600.00	3,013.97	2,825.00	2,822.95	20.68	0.76	21.82	24.94	-15.98	787.75	776.01	11.74	67.097		
3,700.00	3,014.27	2,812.08	2,810.68	22.27	0.69	35.46	26.02	-12.10	883.94	871.55	12.38	71.379		
3,800.00	3,014.63	2,800.00	2,799.05	24.26	0.63	45.84	26.87	-8.95	979.67	966.39	13.28	73.782		
3,900.00	3,015.07	2,800.00	2,799.05	26.52	0.63	55.09	26.87	-8.95	1,074.18	1,059.80	14.38	74.681		
4,000.00	3,015.57	2,800.00	2,799.05	28.95	0.63	61.84	26.87	-8.95	1,167.36	1,151.77	15.59	74.892		
4,100.00	3,016.13	2,800.00	2,799.05	31.43	0.63	66.79	26.87	-8.95	1,258.86	1,242.05	16.81	74.882		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - Lat 2 - Design #2													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2629-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
3,500.00	3,013.74	3,500.00	3,013.74	0.00	0.00	0.00	-222.38	600.73	0.00	0.00	0.00	N/A		
3,510.16	3,013.76	3,510.16	3,013.76	0.25	0.39	-89.51	-226.35	610.08	0.05	-0.59	0.64	0.071 Level 1		
3,600.00	3,013.97	3,599.87	3,013.93	2.47	3.80	-89.52	-261.43	692.65	4.36	-1.90	6.26	0.696 Level 1		
3,700.00	3,014.27	3,698.99	3,014.12	4.01	7.63	-89.54	-300.18	783.87	17.41	5.78	11.63	1.497 Level 3		
3,800.00	3,014.63	3,796.58	3,014.30	5.96	11.44	-89.55	-338.33	873.70	39.05	21.69	17.36	2.250		
3,900.00	3,015.07	3,891.93	3,014.48	8.23	15.19	-89.58	-375.61	961.46	69.11	45.83	23.28	2.969 CC, ES, SF		
4,000.00	3,015.57	3,984.28	3,014.65	10.70	18.85	-89.60	-411.72	1,046.46	107.36	78.13	29.23	3.673		
4,100.00	3,016.13	4,072.96	3,014.82	13.28	22.38	-89.63	-446.38	1,128.08	153.52	118.45	35.08	4.377		
4,200.00	3,016.75	4,157.27	3,014.98	15.91	25.75	-89.66	-479.35	1,205.68	207.24	166.52	40.71	5.090		
4,300.00	3,017.42	4,236.58	3,015.12	18.52	28.92	-89.69	-510.35	1,278.68	268.09	222.05	46.04	5.823		
4,400.00	3,018.14	4,310.28	3,015.26	21.07	31.88	-89.73	-539.17	1,346.52	335.63	284.64	50.99	6.582		
4,500.00	3,018.89	4,378.43	3,015.39	23.53	34.62	-89.75	-565.81	1,409.24	408.80	353.24	55.55	7.359		
4,600.00	3,019.65	4,445.55	3,015.52	25.99	37.32	-89.75	-592.05	1,471.01	482.93	422.90	60.03	8.045		
4,700.00	3,020.41	4,512.67	3,015.64	28.52	40.02	-89.75	-618.29	1,532.79	557.06	492.52	64.53	8.632		
4,800.00	3,021.17	4,579.79	3,015.77	31.09	42.73	-89.75	-644.53	1,594.57	631.18	562.13	69.06	9.140		
4,900.00	3,021.93	4,646.90	3,015.89	33.72	45.44	-89.75	-670.78	1,656.34	705.31	631.71	73.60	9.583		
5,000.00	3,022.69	4,714.02	3,016.02	36.37	48.15	-89.75	-697.02	1,718.12	779.44	701.28	78.16	9.973		
5,100.00	3,023.45	4,781.14	3,016.14	39.07	50.87	-89.75	-723.26	1,779.89	853.57	770.84	82.73	10.317		
5,200.00	3,024.21	4,848.26	3,016.27	41.79	53.58	-89.75	-749.50	1,841.67	927.70	840.39	87.32	10.625		
5,300.00	3,024.97	4,915.38	3,016.40	44.53	56.30	-89.75	-775.74	1,903.45	1,001.83	909.92	91.91	10.900		
5,400.00	3,025.73	4,982.50	3,016.52	47.29	59.02	-89.75	-801.98	1,965.22	1,075.96	979.44	96.52	11.148		
5,500.00	3,026.49	5,049.61	3,016.65	50.07	61.74	-89.75	-828.22	2,027.00	1,150.09	1,048.96	101.13	11.373		
5,600.00	3,027.25	5,116.73	3,016.77	52.87	64.47	-89.75	-854.46	2,088.77	1,224.22	1,118.47	105.75	11.577		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 156-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	Offset Wellbore Centre +E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,629.30	2,629.12	2,629.29	2,629.12	0.00	0.00	-164.63		27.22	0.00	0.80				
2,700.00	2,699.46	2,699.60	2,699.42	0.38	0.29	-175.53		28.27	0.00	6.53	5.89	0.64	10.202	
2,800.00	2,794.40	2,794.35	2,794.17	0.86	0.68	-178.02		29.74	0.00	37.56	36.11	1.45	25.979	
2,900.00	2,878.23	2,877.82	2,877.63	0.66	1.03	-178.61		31.11	0.00	92.08	90.45	1.63	56.480	
3,000.00	2,945.23	2,944.30	2,944.10	2.41	1.31	-178.82		32.24	0.00	166.37	163.37	3.01	55.359 CC, ES	
3,100.00	2,990.84	2,955.00	2,954.79	4.89	1.35	-178.70		32.43	0.00	257.65	252.90	4.75	54.286	
3,200.00	3,011.94	2,955.00	2,954.79	7.91	1.35	-0.13		32.43	0.00	357.17	350.50	6.67	53.520 SF	
3,300.00	3,013.37	2,955.00	2,954.79	11.24	1.35	0.33		32.43	0.00	456.31	447.91	8.40	54.317	
3,400.00	3,013.56	2,955.00	2,954.79	14.75	1.35	0.33		32.43	0.00	555.65	545.68	9.97	55.715	
3,500.00	3,013.74	2,955.00	2,954.79	18.39	1.35	0.33		32.43	0.00	655.19	643.75	11.44	57.253	
3,600.00	3,013.97	2,955.00	2,954.79	20.68	1.35	47.09		32.43	0.00	754.74	743.03	11.71	64.441	
3,700.00	3,014.27	2,955.00	2,954.79	22.27	1.35	66.61		32.43	0.00	853.76	841.29	12.48	68.422	
3,800.00	3,014.63	2,955.00	2,954.79	24.26	1.35	74.92		32.43	0.00	951.79	938.28	13.51	70.461	
3,900.00	3,015.07	2,955.00	2,954.79	26.52	1.35	79.25		32.43	0.00	1,048.45	1,033.74	14.71	71.265	
4,000.00	3,015.57	2,955.00	2,954.79	28.95	1.35	81.83		32.43	0.00	1,143.46	1,127.46	16.00	71.469	
4,100.00	3,016.13	2,955.00	2,954.79	31.43	1.35	83.51		32.43	0.00	1,236.55	1,219.25	17.29	71.505	

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #020m - Allison Unit #020m - Allison Unit #020m													Offset Site Error:	0.00 ft
Survey Program: 246-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		
5,500.00	3,026.49	3,052.90	3,052.23	71.87	12.22	91.10	-2,623.82	572.98	1,246.09	1,162.11	83.98	14.838		
5,600.00	3,027.25	3,050.36	3,049.70	74.49	12.21	90.98	-2,623.91	572.98	1,220.37	1,134.13	86.24	14.151		
5,700.00	3,028.01	3,047.83	3,047.16	77.14	12.20	90.86	-2,623.99	572.98	1,202.44	1,114.28	88.16	13.639		
5,800.00	3,028.77	3,045.29	3,044.63	79.82	12.18	90.74	-2,624.08	572.98	1,192.65	1,102.98	89.67	13.301		
5,867.36	3,029.29	3,043.58	3,042.92	81.63	12.18	90.66	-2,624.14	572.98	1,190.74	1,100.33	90.41	13.170 CC, ES		
5,900.00	3,029.53	3,042.75	3,042.09	82.51	12.17	90.62	-2,624.17	572.98	1,191.19	1,100.50	90.69	13.134 SF		
6,000.00	3,030.30	3,040.22	3,039.56	85.23	12.16	90.49	-2,624.26	572.98	1,198.10	1,106.89	91.22	13.135		
6,100.00	3,031.06	3,037.68	3,037.02	87.96	12.15	90.37	-2,624.35	572.98	1,213.24	1,122.00	91.24	13.297		
6,200.00	3,031.82	3,035.14	3,034.49	90.71	12.14	90.25	-2,624.44	572.98	1,236.30	1,145.50	90.80	13.615		
6,300.00	3,032.58	3,032.61	3,031.95	93.48	12.13	90.13	-2,624.53	572.98	1,266.86	1,176.89	89.96	14.082		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #024 - Allison Unit #024 - Allison Unit #024													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	
0.00	0.00	0.00	0.00	0.00	0.00	95.57	-5.99	61.37	61.66					
100.00	100.00	99.90	99.90	0.19	0.18	96.11	-6.15	61.43	61.78	61.42	0.36	171.444		
200.00	199.99	199.88	199.88	0.50	0.60	97.52	-6.53	61.55	62.09	61.00	1.09	57.029		
300.00	299.98	300.12	300.11	0.92	0.95	99.30	-7.15	61.45	62.27	60.40	1.86	33.443		
400.00	399.97	400.15	400.14	1.34	1.26	101.19	-7.87	61.08	62.26	59.67	2.59	24.045		
500.00	499.97	500.00	499.99	1.76	1.59	103.06	-8.54	60.61	62.22	58.88	3.34	18.624		
507.76	507.73	507.92	507.91	1.79	1.62	103.21	-8.60	60.57	62.22	58.82	3.40	18.287		
600.00	599.96	599.71	599.70	2.18	1.95	105.04	-9.41	60.42	62.57	58.44	4.12	15.179		
700.00	699.95	699.77	699.75	2.59	2.34	106.94	-10.41	60.51	63.26	58.34	4.92	12.854		
800.00	799.95	799.69	799.66	3.00	2.72	108.57	-11.33	60.62	63.95	58.23	5.72	11.177		
900.00	899.94	899.70	899.68	3.41	3.11	109.94	-12.18	60.77	64.65	58.13	6.52	9.916		
1,000.00	999.94	999.51	999.48	3.82	3.48	111.09	-13.03	61.05	65.43	58.13	7.30	8.964		
1,100.00	1,099.94	1,099.60	1,099.57	4.24	3.83	112.01	-13.82	61.41	66.24	58.17	8.07	8.209		
1,200.00	1,199.94	1,199.78	1,199.74	4.65	4.23	112.90	-14.57	61.56	66.83	57.95	8.87	7.531		
1,300.00	1,299.94	1,299.79	1,299.75	5.06	4.64	113.83	-15.31	61.55	67.28	57.58	9.70	6.937		
1,400.00	1,399.94	1,399.99	1,399.95	5.48	5.01	114.78	-16.02	61.37	67.59	57.10	10.49	6.446		
1,500.00	1,499.93	1,499.92	1,499.87	5.89	5.37	115.68	-16.64	61.12	67.81	56.55	11.26	6.023		
1,600.00	1,599.93	1,600.03	1,599.98	6.31	5.72	116.55	-17.21	60.85	68.02	56.00	12.03	5.655		
1,700.00	1,699.93	1,699.97	1,699.92	6.73	6.07	117.57	-17.73	60.55	68.31	55.52	12.79	5.340		
1,800.00	1,799.93	1,800.30	1,800.25	7.15	6.31	118.74	-18.05	60.12	68.56	55.11	13.45	5.096		
1,900.00	1,899.92	1,900.52	1,900.46	7.57	6.42	120.08	-18.12	59.35	68.59	54.60	13.99	4.904		
2,000.00	1,999.90	2,001.06	2,001.00	7.99	6.55	121.42	-17.66	58.22	68.23	53.69	14.53	4.695		
2,100.00	2,099.89	2,101.20	2,101.12	8.40	6.72	122.66	-16.78	56.74	67.40	52.28	15.12	4.459		
2,200.00	2,199.88	2,201.24	2,201.14	8.82	6.90	123.95	-15.90	55.07	66.40	50.69	15.71	4.226		
2,300.00	2,299.87	2,300.98	2,300.87	9.23	7.09	125.30	-15.18	53.48	65.53	49.22	16.31	4.017		
2,400.00	2,399.86	2,401.00	2,400.88	9.65	7.28	126.75	-14.68	51.92	64.81	47.89	16.92	3.830		
2,500.00	2,499.85	2,501.24	2,501.10	10.06	7.49	128.24	-14.08	50.14	63.85	46.30	17.55	3.638		
2,600.00	2,599.84	2,601.20	2,601.04	10.47	7.73	129.81	-13.37	48.22	62.77	44.58	18.20	3.450		
2,700.00	2,699.86	2,700.76	2,700.58	10.66	7.98	125.22	-12.62	46.28	61.60	43.67	18.63	2.984		
2,800.00	2,794.40	2,795.07	2,794.86	10.76	8.24	51.54	-11.77	44.37	28.48	9.52	18.97	1.502		
2,838.67	2,828.47	2,828.70	2,828.48	10.83	8.33	90.03	-11.45	43.64	21.20	2.08	19.12	1.109	Level 2, CC, ES, SF	
2,900.00	2,878.23	2,877.41	2,877.18	10.99	8.47	142.17	-10.99	42.44	42.63	23.29	19.34	2.204		
3,000.00	2,945.23	2,942.02	2,941.76	11.85	8.65	160.27	-10.43	40.63	114.67	94.96	19.72	5.816		
3,100.00	2,990.84	2,984.75	2,984.47	13.63	8.77	159.79	-10.19	39.33	203.76	183.77	19.98	10.197		
3,200.00	3,011.94	3,002.75	3,002.46	16.29	8.82	122.45	-10.12	38.76	301.39	281.28	20.11	14.990		
3,300.00	3,013.37	3,001.11	3,000.82	19.49	8.81	64.11	-10.12	38.81	401.11	381.00	20.11	19.947		
3,400.00	3,013.56	2,998.24	2,997.95	22.97	8.80	58.88	-10.13	38.90	500.92	480.81	20.10	24.917		
3,500.00	3,013.74	2,995.38	2,995.09	26.62	8.80	54.17	-10.14	39.00	600.78	580.68	20.10	29.890		
3,600.00	3,013.97	2,992.61	2,992.32	29.09	8.79	76.21	-10.16	39.08	700.40	678.93	21.47	32.619		
3,700.00	3,014.27	2,990.01	2,989.73	30.62	8.78	81.43	-10.17	39.17	799.22	777.79	21.43	37.293		
3,800.00	3,014.63	2,987.61	2,987.32	32.50	8.77	83.76	-10.18	39.24	896.88	875.45	21.43	41.850		
3,900.00	3,015.07	2,985.40	2,985.12	34.63	8.77	85.09	-10.19	39.31	993.08	971.60	21.49	46.217		
4,000.00	3,015.57	2,983.41	2,983.13	36.89	8.76	85.96	-10.20	39.37	1,087.58	1,065.98	21.61	50.335		
4,100.00	3,016.13	2,981.65	2,981.37	39.22	8.76	86.57	-10.20	39.43	1,180.16	1,158.37	21.79	54.165		

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #039m - Allison Unit #039m - Allison Unit #039m												Offset Site Error:	0.00 ft
Survey Program: 245-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)		
6,487.21	3,034.00	3,056.04	3,055.74	98.69	12.27	92.18	-4,064.55	1,982.92	1,248.12	1,185.51	62.61	19.935	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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 2 ST01	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #112s - Allison Unit #112s - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 12-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		
5,600.00	3,027.25	2,967.00	2,966.66	74.49	12.01	87.05	-2,647.90	552.56	1,251.67	1,165.66	86.01	14.553		
5,700.00	3,028.01	2,967.00	2,966.66	77.14	12.01	87.05	-2,647.90	552.56	1,232.95	1,144.96	87.99	14.012		
5,800.00	3,028.77	2,967.00	2,966.66	79.82	12.01	87.05	-2,647.90	552.56	1,222.15	1,132.57	89.59	13.642		
5,882.53	3,029.40	2,967.00	2,966.66	82.04	12.01	87.05	-2,647.90	552.56	1,219.36	1,128.80	90.56	13.464 CC		
5,900.00	3,029.53	2,967.00	2,966.66	82.51	12.01	87.05	-2,647.90	552.56	1,219.49	1,128.76	90.73	13.441 ES		
6,000.00	3,030.30	2,967.00	2,966.66	85.23	12.01	87.05	-2,647.90	552.56	1,225.01	1,133.62	91.39	13.404 SF		
6,100.00	3,031.06	2,967.00	2,966.66	87.96	12.01	87.05	-2,647.90	552.56	1,238.60	1,147.03	91.58	13.525		
6,200.00	3,031.82	2,967.00	2,966.66	90.71	12.01	87.05	-2,647.90	552.56	1,260.01	1,168.71	91.30	13.800		



Anticollision Report



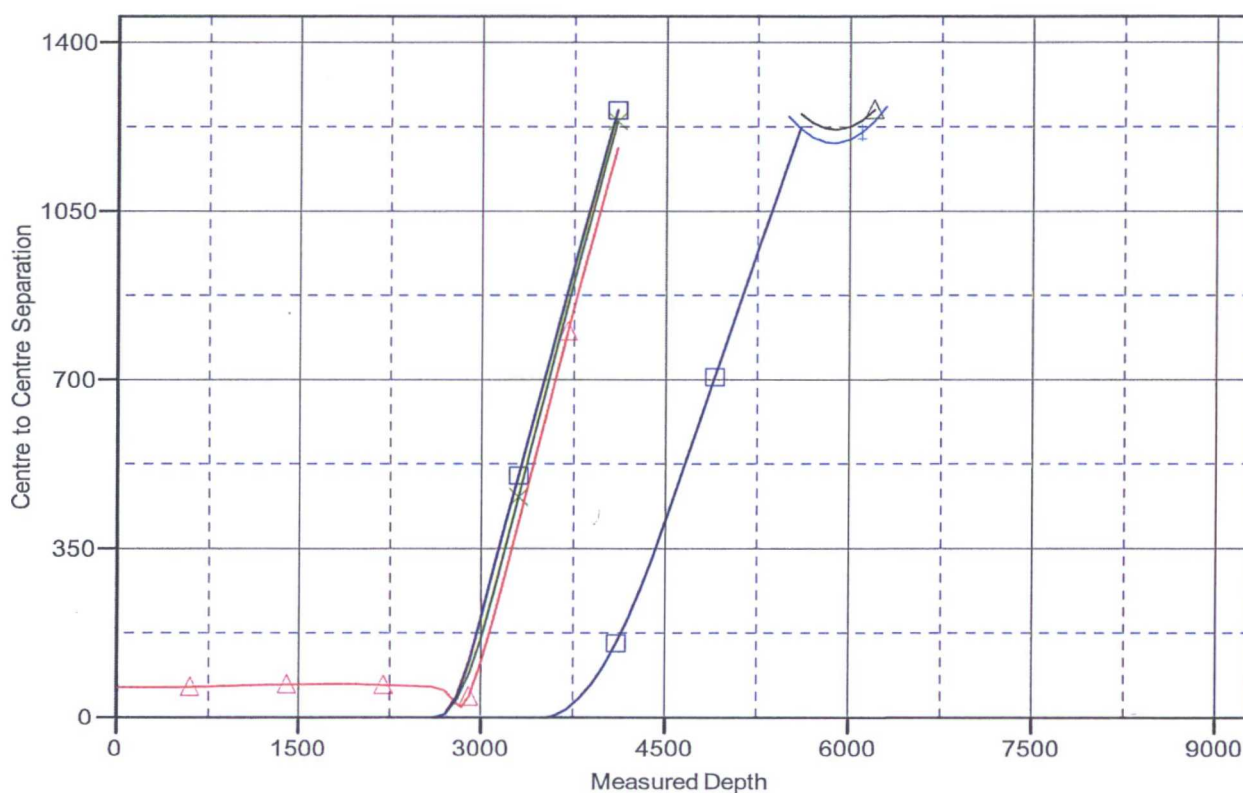
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 2 ST01
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND

112s, Allison Unit #112s, Wellbore #1 V0
020m, Allison Unit #020m, Allison Unit #020m V0
039m, Allison Unit #039m, Allison Unit #039m V0
Allison Unit #024, Allison Unit #024, Allison Unit #024 V0
Allison Unit #145H, Lat 1, Design #1 V0
Allison Unit #145H, OH, OH V0
Allison Unit #145H, Lat 2, Design #2 V0
Allison Unit #145H, Lat 1 ST01, Design #1 V0

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 #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 2 ST01
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft

Offset Depths are relative to Offset Datum

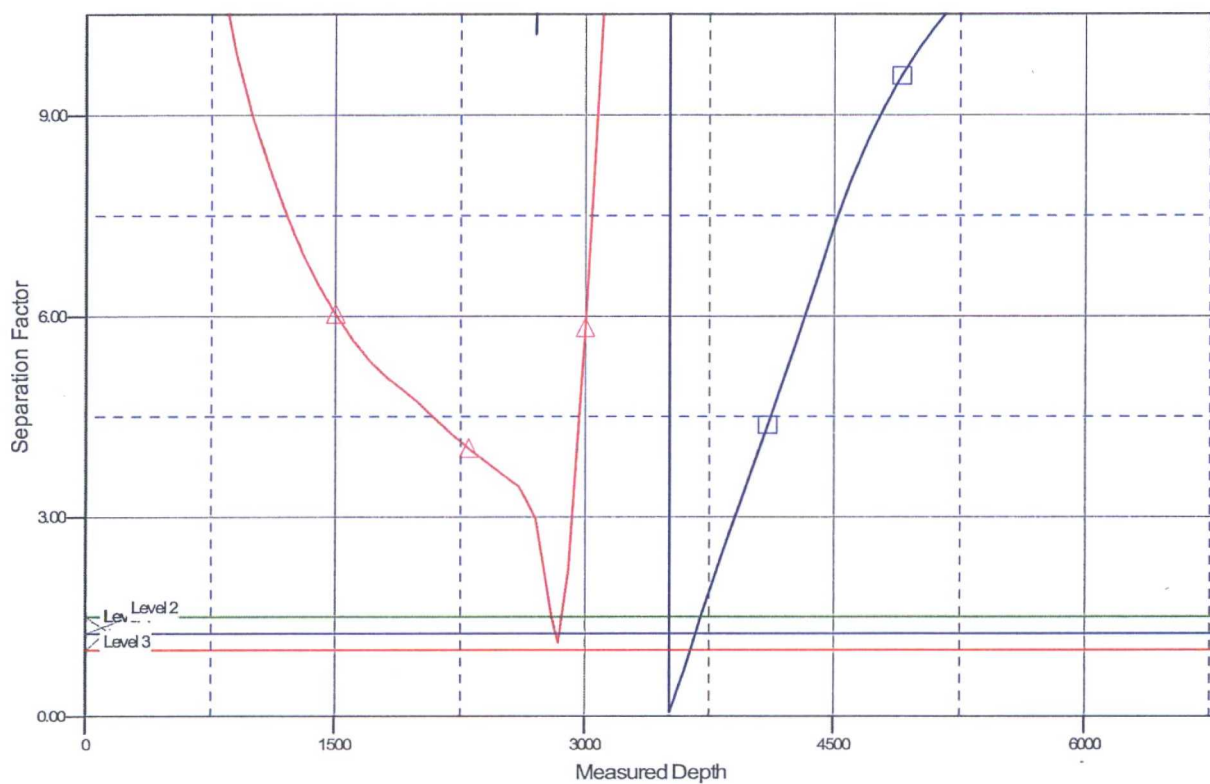
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H

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

Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND

Well 112s, Allison Unit #112s, Wellbore #1 V0

Well 020m, Allison Unit #020m, Allison Unit #020m V0

Well 039m, Allison Unit #039m, Allison Unit #039m V0

Well 024, Allison Unit #024, Allison Unit #024 V0

Well 145H, Allison Unit #145H, Lat 1, Design #1 V0

Well 145H, Allison Unit #145H, OH, OH V0

Well 145H, Allison Unit #145H, Lat 2, Design #2 V0

Well 145H, Allison Unit #145H, Lat 1 ST01, Design #1 V0



HILCORP ENERGY COMPANY
ALLISON UNIT #145 Lat 3
SAN JUAN BASIN NM
6519' GL + 15' KB



WELL DETAILS: Allison Unit #145H

+N/-S	+E/-W	Northing	Ground Level:	6519.00	Latitude	Longitude
0.00	0.00	2179789.300	Easting	595785.900	36° 59' 23.953 N	107° 30' 19.296 W

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

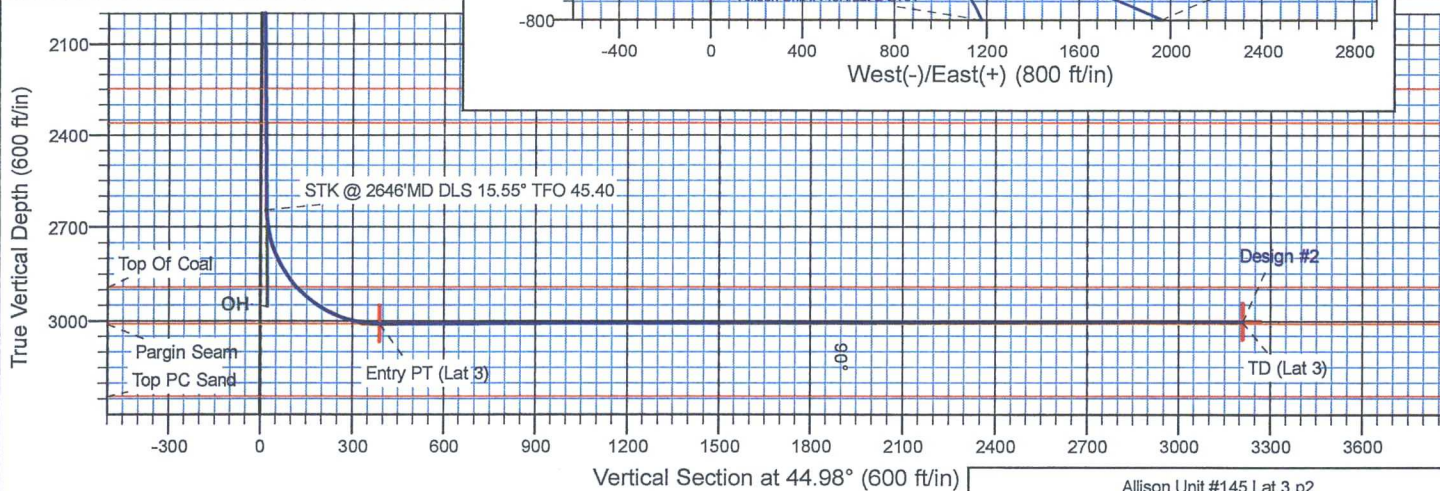
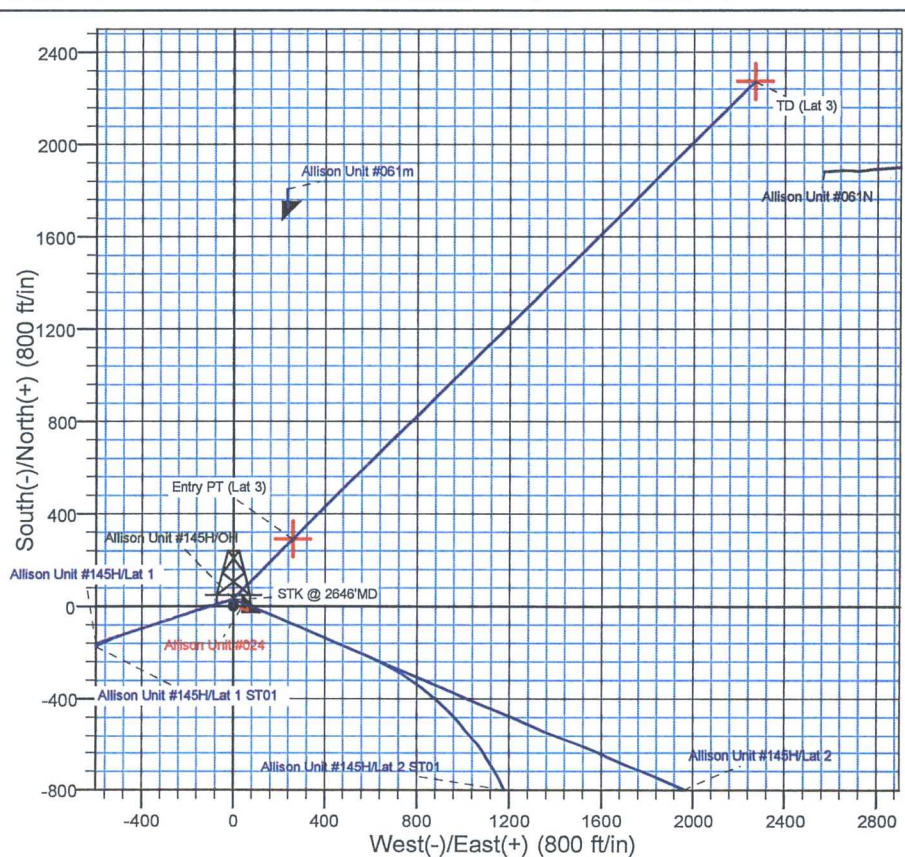
System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	2646.00	0.84	0.00	2645.83	27.47	0.00	0.00	0.00	19.43	
2	3221.83	90.13	45.40	3010.48	289.50	260.25	15.55	45.40	388.73	
3	6043.31	90.13	45.40	3004.00	2270.70	2269.10	0.00	0.00	3210.13	TD (Lat 3)

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
TD (Lat 3)	3004.00	2270.70	2269.10	2182060.000	598055.000	36° 59' 46.329 N	107° 29' 51.228 W	Point
Entry PT (Lat 3)	3010.48	289.50	260.25	2180078.799	596046.149	36° 59' 26.807 N	107° 30' 16.076 W	Point



Allison Unit #145 Lat 3 p2

Created By: Frank Scardino Date: 2/12/2018
 Checked: _____ Date: _____



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 3

Plan: Design #2

Standard Planning Report - Geographic

12 February, 2018





Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Allison Unit #145H
Company:	Hilcorp Energy Company	TVD Reference:	rig @ 6534.00ft
Project:	San Juan County, NM	MD Reference:	rig @ 6534.00ft
Site:	Allison Unit #145H	North Reference:	Grid
Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lat 3		
Design:	Design #2		

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 #145H		
Site Position:		Northing:	2,179,789.300 usft
From:	Map	Easting:	595,785.900 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 59' 23.953 N
		Longitude:	107° 30' 19.296 W
		Grid Convergence:	0.20 °

Well	Allison Unit #145H		
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' 23.953 N
		Longitude:	107° 30' 19.296 W
		Ground Level:	6,519.00 ft

Wellbore	Lat 3		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	2/7/2018	9.12
			Dip Angle (°)
			63.59
			Field Strength (nT)
			50,138

Design	Design #2		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			2,646.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction (°)
			44.98

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth (ft)	(°)	(°)	Depth (ft)	(ft)	(ft)	Rate (°/100ft)	Rate (°/100ft)	Rate (°/100ft)	(°)	
2,646.00	0.84	0.00	2,645.83	27.47	0.00	0.00	0.00	0.00	0.00	
3,221.83	90.13	45.40	3,010.48	289.50	260.25	15.55	15.51	7.88	45.40	
6,043.31	90.13	45.40	3,004.00	2,270.70	2,269.10	0.00	0.00	0.00	0.00	TD (Lat 3)



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 3
Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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
2,646.00	0.84	0.00	2,645.83	27.47	0.00	2,179,816.766	595,785.900	36° 59' 24.225 N	107° 30' 19.295 W
STK @ 2646°MD DLS 15.55° TFO 45.40									
2,650.00	1.35	19.12	2,649.83	27.54	0.02	2,179,816.840	595,785.915	36° 59' 24.226 N	107° 30' 19.295 W
2,675.00	5.13	38.72	2,674.79	28.69	0.81	2,179,817.992	595,786.712	36° 59' 24.237 N	107° 30' 19.285 W
2,700.00	9.01	41.62	2,699.59	31.03	2.81	2,179,820.329	595,788.712	36° 59' 24.260 N	107° 30' 19.260 W
2,725.00	12.89	42.78	2,724.13	34.54	6.01	2,179,823.840	595,791.907	36° 59' 24.295 N	107° 30' 19.221 W
2,750.00	16.77	43.41	2,748.30	39.21	10.38	2,179,828.509	595,796.281	36° 59' 24.341 N	107° 30' 19.167 W
2,775.00	20.66	43.81	2,771.97	45.01	15.91	2,179,834.314	595,801.815	36° 59' 24.398 N	107° 30' 19.098 W
2,800.00	24.54	44.08	2,795.04	51.93	22.58	2,179,841.229	595,808.482	36° 59' 24.466 N	107° 30' 19.016 W
2,825.00	28.43	44.29	2,817.42	59.92	30.35	2,179,849.222	595,816.253	36° 59' 24.545 N	107° 30' 18.919 W
2,850.00	32.32	44.45	2,838.98	68.96	39.19	2,179,858.256	595,825.092	36° 59' 24.634 N	107° 30' 18.810 W
2,875.00	36.20	44.58	2,859.64	78.99	49.06	2,179,868.289	595,834.958	36° 59' 24.733 N	107° 30' 18.688 W
2,900.00	40.09	44.68	2,879.30	89.98	59.91	2,179,879.276	595,845.805	36° 59' 24.841 N	107° 30' 18.554 W
2,919.67	43.15	44.76	2,894.00	99.26	69.10	2,179,888.559	595,854.998	36° 59' 24.932 N	107° 30' 18.440 W
Top Of Coal									
2,925.00	43.98	44.78	2,897.86	101.87	71.68	2,179,891.165	595,857.584	36° 59' 24.958 N	107° 30' 18.408 W
2,950.00	47.87	44.85	2,915.25	114.60	84.34	2,179,903.903	595,870.240	36° 59' 25.084 N	107° 30' 18.252 W
2,975.00	51.75	44.92	2,931.38	128.13	97.82	2,179,917.430	595,883.715	36° 59' 25.217 N	107° 30' 18.085 W
3,000.00	55.64	44.99	2,946.18	142.38	112.05	2,179,931.685	595,897.947	36° 59' 25.357 N	107° 30' 17.909 W
3,025.00	59.53	45.04	2,959.58	157.30	126.97	2,179,946.601	595,912.871	36° 59' 25.504 N	107° 30' 17.724 W
3,050.00	63.41	45.10	2,971.51	172.81	142.52	2,179,962.110	595,928.419	36° 59' 25.657 N	107° 30' 17.532 W
3,075.00	67.30	45.15	2,981.94	188.84	158.62	2,179,978.140	595,944.517	36° 59' 25.815 N	107° 30' 17.333 W
3,100.00	71.19	45.19	2,990.79	205.32	175.19	2,179,994.619	595,961.093	36° 59' 25.978 N	107° 30' 17.128 W
3,125.00	75.08	45.24	2,998.05	222.17	192.17	2,180,011.469	595,978.070	36° 59' 26.144 N	107° 30' 16.918 W
3,150.00	78.96	45.28	3,003.66	239.31	209.47	2,180,028.614	595,995.370	36° 59' 26.313 N	107° 30' 16.704 W
3,175.00	82.85	45.32	3,007.61	256.68	227.01	2,180,045.975	596,012.913	36° 59' 26.484 N	107° 30' 16.487 W
3,200.00	86.74	45.36	3,009.88	274.17	244.72	2,180,063.471	596,030.619	36° 59' 26.656 N	107° 30' 16.268 W
3,221.83	90.13	45.40	3,010.48	289.50	260.25	2,180,078.795	596,046.147	36° 59' 26.807 N	107° 30' 16.076 W
3,221.83	90.13	45.40	3,010.48	289.50	260.25	2,180,078.799	596,046.150	36° 59' 26.807 N	107° 30' 16.076 W
Entry PT (Lat 3)									
3,300.00	90.13	45.40	3,010.30	344.39	315.91	2,180,133.687	596,101.804	36° 59' 27.348 N	107° 30' 15.388 W
3,400.00	90.13	45.40	3,010.07	414.61	387.10	2,180,203.905	596,173.003	36° 59' 28.040 N	107° 30' 14.507 W
3,500.00	90.13	45.40	3,009.84	484.82	458.30	2,180,274.124	596,244.202	36° 59' 28.732 N	107° 30' 13.626 W
3,600.00	90.13	45.40	3,009.61	555.04	529.50	2,180,344.343	596,315.400	36° 59' 29.424 N	107° 30' 12.746 W
3,700.00	90.13	45.40	3,009.38	625.26	600.70	2,180,414.562	596,386.599	36° 59' 30.116 N	107° 30' 11.865 W
3,800.00	90.13	45.40	3,009.15	695.48	671.90	2,180,484.780	596,457.797	36° 59' 30.807 N	107° 30' 10.984 W
3,900.00	90.13	45.40	3,008.92	765.70	743.10	2,180,554.999	596,528.996	36° 59' 31.499 N	107° 30' 10.104 W
4,000.00	90.13	45.40	3,008.69	835.92	814.30	2,180,625.218	596,600.195	36° 59' 32.191 N	107° 30' 9.223 W
4,100.00	90.13	45.40	3,008.46	906.14	885.50	2,180,695.436	596,671.393	36° 59' 32.883 N	107° 30' 8.342 W
4,200.00	90.13	45.40	3,008.23	976.36	956.69	2,180,765.655	596,742.592	36° 59' 33.575 N	107° 30' 7.462 W
4,300.00	90.13	45.40	3,008.00	1,046.58	1,027.89	2,180,835.874	596,813.790	36° 59' 34.267 N	107° 30' 6.581 W
4,400.00	90.13	45.40	3,007.77	1,116.79	1,099.09	2,180,906.092	596,884.989	36° 59' 34.959 N	107° 30' 5.700 W
4,500.00	90.13	45.40	3,007.54	1,187.01	1,170.29	2,180,976.311	596,956.188	36° 59' 35.651 N	107° 30' 4.820 W
4,600.00	90.13	45.40	3,007.31	1,257.23	1,241.49	2,181,046.530	597,027.386	36° 59' 36.343 N	107° 30' 3.939 W
4,700.00	90.13	45.40	3,007.08	1,327.45	1,312.69	2,181,116.749	597,098.585	36° 59' 37.035 N	107° 30' 3.058 W
4,800.00	90.13	45.40	3,006.85	1,397.67	1,383.89	2,181,186.967	597,169.783	36° 59' 37.726 N	107° 30' 2.178 W
4,900.00	90.13	45.40	3,006.62	1,467.89	1,455.09	2,181,257.186	597,240.982	36° 59' 38.418 N	107° 30' 1.297 W
5,000.00	90.13	45.40	3,006.39	1,538.11	1,526.28	2,181,327.405	597,312.181	36° 59' 39.110 N	107° 30' 0.416 W
5,100.00	90.13	45.40	3,006.17	1,608.33	1,597.48	2,181,397.623	597,383.379	36° 59' 39.802 N	107° 29' 59.536 W
5,200.00	90.13	45.40	3,005.94	1,678.55	1,668.68	2,181,467.842	597,454.578	36° 59' 40.494 N	107° 29' 58.655 W
5,300.00	90.13	45.40	3,005.71	1,748.76	1,739.88	2,181,538.061	597,525.776	36° 59' 41.186 N	107° 29' 57.774 W
5,400.00	90.13	45.40	3,005.48	1,818.98	1,811.08	2,181,608.280	597,596.975	36° 59' 41.878 N	107° 29' 56.894 W
5,500.00	90.13	45.40	3,005.25	1,889.20	1,882.28	2,181,678.498	597,668.174	36° 59' 42.570 N	107° 29' 56.013 W
5,600.00	90.13	45.40	3,005.02	1,959.42	1,953.48	2,181,748.717	597,739.372	36° 59' 43.261 N	107° 29' 55.132 W



Planning Report - Geographic



Database: EDM 5000.1 Single User Db
Company: Hilcorp Energy Company
Project: San Juan County, NM
Site: Allison Unit #145H
Well: Allison Unit #145H
Wellbore: Lat 3
Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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
5,700.00	90.13	45.40	3,004.79	2,029.64	2,024.68	2,181,818.936	597,810.571	36° 59' 43.953 N	107° 29' 54.251 W
5,800.00	90.13	45.40	3,004.56	2,099.86	2,095.87	2,181,889.154	597,881.769	36° 59' 44.645 N	107° 29' 53.371 W
5,900.00	90.13	45.40	3,004.33	2,170.08	2,167.07	2,181,959.373	597,952.968	36° 59' 45.337 N	107° 29' 52.490 W
6,000.00	90.13	45.40	3,004.10	2,240.30	2,238.27	2,182,029.592	598,024.167	36° 59' 46.029 N	107° 29' 51.609 W
6,043.31	90.13	45.40	3,004.00	2,270.70	2,269.10	2,182,060.000	598,055.000	36° 59' 46.329 N	107° 29' 51.228 W
TD (Lat 3)									

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 (Lat 3) - plan hits target center - Point	0.00	0.00	3,004.00	2,270.70	2,269.10	2,182,060.000	598,055.000	36° 59' 46.329 N	107° 29' 51.228 W
Entry PT (Lat 3) - plan hits target center - Point	0.00	0.00	3,010.48	289.50	260.25	2,180,078.800	596,046.149	36° 59' 26.807 N	107° 30' 16.076 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,919.67	2,894.00	Top Of Coal			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,646.00	2,645.83	27.47	0.00	STK @ 2646'MD DLS 15.55° TFO 45.40



Hilcorp Energy Company

San Juan County, NM

Allison Unit #145H

Allison Unit #145H

Lat 3

Design #2

Anticollision Report

13 February, 2018





Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 3	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Reference	Design #2		
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 1,657.46 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	2/13/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,646.00	OH (OH)	MWD	MWD - Standard	
2,646.00	6,043.31	Design #2 (Lat 3)	MWD	MWD - Standard	

Summary	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Site Name						
Offset Well - Wellbore - Design						
Allison Unit #145H						
Allison Unit #145H - Lat 1 - Design #1	3,000.00	2,863.49	207.08	203.50	57.750	CC, ES
Allison Unit #145H - Lat 1 - Design #1	3,300.00	2,840.94	496.62	487.03	51.735	SF
Allison Unit #145H - Lat 1 ST01 - Design #1	3,000.00	2,863.49	207.08	203.50	57.750	CC, ES
Allison Unit #145H - Lat 1 ST01 - Design #1	3,300.00	2,840.94	496.62	487.03	51.735	SF
Allison Unit #145H - Lat 2 - Design #3	3,000.00	2,939.50	153.00	151.37	94.222	CC, ES
Allison Unit #145H - Lat 2 - Design #3	3,500.00	3,119.76	595.25	581.45	43.119	SF
Allison Unit #145H - Lat 2 ST01 - Design #2	3,000.00	2,939.50	153.00	151.37	94.222	CC, ES
Allison Unit #145H - Lat 2 ST01 - Design #2	3,500.00	3,119.76	595.25	581.45	43.119	SF
Allison Unit #145H - OH - OH	3,000.00	2,948.30	157.08	153.12	39.659	CC, ES, SF
Allison Unit #145H Offsets						
Allison Unit #009 - Allison Unit #009 - Allison Unit #009						Out of range
Allison Unit #009m - Allison Unit #009m - Allison Unit #0						Out of range
Allison Unit #009R - Allison Unit #009R - Allison Unit #00						Out of range
Allison Unit #013m - Allison Unit #013m - Allison Unit #0						Out of range
Allison Unit #020m - Allison Unit #020m - Allison Unit #0						Out of range
Allison Unit #024 - Allison Unit #024 - Allison Unit #024	2,716.59	2,717.32	61.52	42.81	3.289	CC, ES, SF
Allison Unit #024A - Allison Unit #024A - Allison Unit #02						Out of range
Allison Unit #039m - Allison Unit #039m - Allison Unit #0						Out of range
Allison Unit #039N - Wellbore #1 - Wellbore #1						Out of range
Allison Unit #061 - Allison Unit #061 - Allison Unit #061	6,043.31	2,994.57	702.48	591.24	6.315	CC, ES, SF
Allison Unit #061m - Allison Unit #061m - Allison Unit #0	4,244.99	2,999.06	1,075.49	1,018.30	18.804	CC
Allison Unit #061m - Allison Unit #061m - Allison Unit #0	4,300.00	2,999.41	1,076.90	1,018.03	18.294	ES
Allison Unit #061m - Allison Unit #061m - Allison Unit #0	4,600.00	3,001.35	1,132.57	1,066.86	17.237	SF
Allison Unit #061N - Allison Unit #061N - Allison Unit #06	6,043.31	3,414.02	714.90	596.91	6.059	CC, ES, SF
Allison Unit #112s - Allison Unit #112s - Wellbore #1						Out of range
Allison Unit #125s - Allison Unit #125s - Allison Unit #125						Out of range
Allison Unit #133s - Allison Unit #133s - Allison Unit #133						Out of range
Allison Unit #134s - Allison Unit #134s - Allison Unit #134						Out of range
Allison Unit #057N - Allison Unit #057N - Allison Unit #057						Out of range

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 #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 3	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - Lat 1 - Design #1													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2726-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance				Minimum Separation (ft)	Separation Factor	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)				
2,646.00	2,645.78	2,645.97	2,645.80	0.00	0.00	-172.30	27.47	0.00	1.55					
2,700.00	2,699.59	2,699.81	2,699.63	0.15	0.22	-176.04	28.27	0.00	3.94	3.61	0.33	11.974		
2,800.00	2,795.04	2,788.35	2,787.72	0.41	0.52	-173.02	27.55	-6.35	38.54	36.79	1.75	21.998		
2,900.00	2,879.30	2,841.69	2,838.52	1.24	0.80	-168.30	23.29	-21.77	113.05	110.75	2.30	49.066		
3,000.00	2,946.18	2,863.49	2,858.28	2.96	0.91	-155.70	20.70	-30.60	207.08	203.50	3.59	57.750 CC, ES		
3,100.00	2,990.79	2,865.44	2,860.01	5.13	0.92	-22.76	20.45	-31.46	306.58	300.87	5.71	53.711		
3,200.00	3,009.88	2,850.00	2,846.13	7.65	0.85	-4.14	22.36	-24.97	403.68	395.90	7.78	51.897		
3,300.00	3,010.30	2,840.94	2,837.83	10.33	0.80	-2.76	23.37	-21.49	496.62	487.03	9.60	51.735 SF		
3,400.00	3,010.07	2,825.00	2,822.95	13.08	0.71	-1.70	24.94	-15.98	591.04	579.79	11.25	52.519		
3,500.00	3,009.84	2,825.00	2,822.95	15.89	0.71	-1.70	24.94	-15.98	686.56	673.73	12.83	53.506		
3,600.00	3,009.61	2,811.48	2,810.11	18.77	0.64	-1.01	26.06	-11.93	782.80	768.51	14.28	54.812		
3,700.00	3,009.38	2,800.00	2,799.05	21.70	0.57	-0.55	26.87	-8.95	879.76	864.11	15.65	56.217		
3,800.00	3,009.15	2,800.00	2,799.05	24.67	0.57	-0.55	26.87	-8.95	977.10	960.14	16.97	57.594		
3,900.00	3,008.92	2,800.00	2,799.05	27.67	0.57	-0.55	26.87	-8.95	1,074.93	1,056.73	18.21	59.037		
4,000.00	3,008.69	2,789.80	2,789.13	30.70	0.52	-0.22	27.47	-6.65	1,172.92	1,153.56	19.36	60.581		
4,100.00	3,008.46	2,786.03	2,785.44	33.75	0.51	-0.11	27.66	-5.88	1,271.23	1,250.75	20.48	62.077		
4,200.00	3,008.23	2,775.00	2,774.60	36.83	0.46	0.14	28.14	-3.92	1,369.84	1,348.32	21.52	63.641		
4,300.00	3,008.00	2,775.00	2,774.60	39.91	0.46	0.14	28.14	-3.92	1,468.44	1,445.88	22.56	65.087		
4,400.00	3,007.77	2,775.00	2,774.60	43.01	0.46	0.14	28.14	-3.92	1,567.21	1,543.66	23.56	66.530		

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 #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H - Allison Unit #145H - Lat 1 ST01 - Design #1												Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2726-MWD, 3400-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
2,646.00	2,645.78	2,645.97	2,645.80	0.00	0.00	-172.30	27.47	0.00	1.55				
2,700.00	2,699.59	2,699.81	2,699.63	0.15	0.22	-176.04	28.27	0.00	3.94	3.61	0.33	11.974	
2,800.00	2,795.04	2,788.35	2,787.72	0.41	0.52	-173.02	27.55	-6.35	38.54	36.79	1.75	21.998	
2,900.00	2,879.30	2,841.69	2,838.52	1.24	0.80	-168.30	23.29	-21.77	113.05	110.75	2.30	49.066	
3,000.00	2,946.18	2,863.49	2,858.28	2.96	0.91	-155.70	20.70	-30.60	207.08	203.50	3.59	57.750 CC, ES	
3,100.00	2,990.79	2,865.44	2,860.01	5.13	0.92	-22.76	20.45	-31.46	306.58	300.87	5.71	53.711	
3,200.00	3,009.88	2,850.00	2,846.13	7.65	0.85	-4.14	22.36	-24.97	403.68	395.90	7.78	51.897	
3,300.00	3,010.30	2,840.94	2,837.83	10.33	0.80	-2.76	23.37	-21.49	496.62	487.03	9.60	51.735 SF	
3,400.00	3,010.07	2,825.00	2,822.95	13.08	0.71	-1.70	24.94	-15.98	591.04	579.79	11.25	52.519	
3,500.00	3,009.84	2,825.00	2,822.95	15.89	0.71	-1.70	24.94	-15.98	686.56	673.73	12.83	53.506	
3,600.00	3,009.61	2,811.48	2,810.11	18.77	0.64	-1.01	26.06	-11.93	782.80	768.51	14.28	54.812	
3,700.00	3,009.38	2,800.00	2,799.05	21.70	0.57	-0.55	26.87	-8.95	879.76	864.11	15.65	56.217	
3,800.00	3,009.15	2,800.00	2,799.05	24.67	0.57	-0.55	26.87	-8.95	977.10	960.14	16.97	57.594	
3,900.00	3,008.92	2,800.00	2,799.05	27.67	0.57	-0.55	26.87	-8.95	1,074.93	1,056.73	18.21	59.037	
4,000.00	3,008.69	2,789.80	2,789.13	30.70	0.52	-0.22	27.47	-6.65	1,172.92	1,153.56	19.36	60.581	
4,100.00	3,008.46	2,786.03	2,785.44	33.75	0.51	-0.11	27.66	-5.88	1,271.23	1,250.75	20.48	62.077	
4,200.00	3,008.23	2,775.00	2,774.60	36.83	0.46	0.14	28.14	-3.92	1,369.84	1,348.32	21.52	63.641	
4,300.00	3,008.00	2,775.00	2,774.60	39.91	0.46	0.14	28.14	-3.92	1,468.44	1,445.88	22.56	65.087	
4,400.00	3,007.77	2,775.00	2,774.60	43.01	0.46	0.14	28.14	-3.92	1,567.21	1,543.66	23.56	66.530	

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 #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H - Allison Unit #145H - Lat 2 - Design #3													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2686-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		
2,646.00	2,645.78	2,645.97	2,645.80	0.00	0.00	-172.30	27.47	0.00	1.55					
2,700.00	2,699.59	2,699.86	2,699.69	0.15	0.20	179.84	28.15	0.27	3.84	3.65	0.19	20.205		
2,800.00	2,795.04	2,795.47	2,793.34	0.41	0.85	143.71	22.55	16.78	30.00	28.97	1.03	29.095		
2,900.00	2,879.30	2,876.44	2,865.89	1.24	1.16	129.38	9.60	49.82	82.11	80.77	1.34	61.235		
3,000.00	2,946.18	2,939.50	2,915.00	2.96	0.83	116.75	-5.18	86.34	153.00	151.37	1.62	94.222 CC, ES		
3,100.00	2,990.79	2,987.13	2,946.55	5.13	1.33	100.34	-18.71	119.30	235.09	230.91	4.18	56.250		
3,200.00	3,009.88	3,022.91	2,966.64	7.65	2.16	79.62	-30.02	146.64	322.52	315.72	6.80	47.399		
3,300.00	3,010.30	3,052.85	2,980.88	10.33	2.90	80.02	-40.13	170.95	411.99	402.70	9.28	44.375		
3,400.00	3,010.07	3,085.16	2,993.46	13.08	3.75	84.94	-51.60	198.39	503.23	491.63	11.60	43.382		
3,500.00	3,009.84	3,119.76	3,003.59	15.89	4.73	88.13	-64.40	228.88	595.25	581.45	13.80	43.119 SF		
3,600.00	3,009.61	3,156.05	3,010.39	18.77	5.81	89.85	-78.25	261.71	687.59	671.66	15.92	43.184		
3,700.00	3,009.38	3,193.22	3,013.20	21.70	6.98	90.42	-92.70	295.81	780.02	762.07	17.96	43.438		
3,800.00	3,009.15	3,231.17	3,013.31	24.67	8.22	90.40	-107.54	330.75	872.49	852.56	19.94	43.767		
3,900.00	3,008.92	3,269.25	3,013.38	27.67	9.49	90.38	-122.42	365.79	964.96	943.15	21.81	44.244		
4,000.00	3,008.69	3,307.32	3,013.45	30.70	10.76	90.36	-137.31	400.83	1,057.43	1,033.84	23.59	44.826		
4,100.00	3,008.46	3,345.39	3,013.52	33.75	12.09	90.34	-152.20	435.87	1,149.90	1,124.57	25.32	45.409		
4,200.00	3,008.23	3,383.47	3,013.59	36.83	13.42	90.33	-167.09	470.92	1,242.36	1,215.40	26.96	46.083		
4,300.00	3,008.00	3,421.54	3,013.66	39.91	14.78	90.32	-181.97	505.96	1,334.83	1,306.30	28.53	46.792		
4,400.00	3,007.77	3,459.62	3,013.73	43.01	16.15	90.31	-196.86	541.00	1,427.30	1,397.28	30.02	47.543		
4,500.00	3,007.54	3,497.69	3,013.80	46.12	17.54	90.30	-211.75	576.05	1,519.77	1,488.35	31.42	48.366		
4,600.00	3,007.31	3,535.76	3,013.87	49.24	18.95	90.29	-226.63	611.09	1,612.24	1,579.48	32.76	49.218		



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H - Allison Unit #145H - Lat 2 ST01 - Design #2													Offset Site Error:	0.00 ft
Survey Program: 156-MWD, 2686-MWD, 3500-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	
2,646.00	2,645.78	2,645.97	2,645.80	0.00	0.00	-172.30	27.47	0.00	1.55					
2,700.00	2,699.59	2,699.86	2,699.69	0.15	0.20	179.84	28.15	0.27	3.84	3.65	0.19	20.205		
2,800.00	2,795.04	2,795.47	2,793.34	0.41	0.85	143.71	22.55	16.78	30.00	28.97	1.03	29.095		
2,900.00	2,879.30	2,876.44	2,865.89	1.24	1.16	129.38	9.60	49.82	82.11	80.77	1.34	61.235		
3,000.00	2,946.18	2,939.50	2,915.00	2.96	0.83	116.75	-5.18	86.34	153.00	151.37	1.62	94.222 CC, ES		
3,100.00	2,990.79	2,987.13	2,946.55	5.13	1.33	100.34	-18.71	119.30	235.09	230.91	4.18	56.250		
3,200.00	3,009.88	3,022.91	2,966.64	7.65	2.16	79.62	-30.02	146.64	322.52	315.72	6.80	47.399		
3,300.00	3,010.30	3,052.85	2,980.88	10.33	2.90	80.02	-40.13	170.95	411.99	402.70	9.28	44.375		
3,400.00	3,010.07	3,085.16	2,993.46	13.08	3.75	84.94	-51.60	198.39	503.23	491.63	11.60	43.382		
3,500.00	3,009.84	3,119.76	3,003.59	15.89	4.73	88.13	-64.40	228.88	595.25	581.45	13.80	43.119 SF		
3,600.00	3,009.61	3,156.05	3,010.39	18.77	5.81	89.85	-78.25	261.71	687.59	671.66	15.92	43.184		
3,700.00	3,009.38	3,193.22	3,013.20	21.70	6.98	90.42	-92.70	295.81	780.02	762.07	17.96	43.438		
3,800.00	3,009.15	3,231.17	3,013.31	24.67	8.22	90.40	-107.54	330.75	872.49	852.56	19.94	43.767		
3,900.00	3,008.92	3,269.25	3,013.38	27.67	9.49	90.38	-122.42	365.79	964.96	943.15	21.81	44.244		
4,000.00	3,008.69	3,307.32	3,013.45	30.70	10.76	90.36	-137.31	400.83	1,057.43	1,033.84	23.59	44.826		
4,100.00	3,008.46	3,345.39	3,013.52	33.75	12.09	90.34	-152.20	435.87	1,149.90	1,124.57	25.32	45.409		
4,200.00	3,008.23	3,383.47	3,013.59	36.83	13.42	90.33	-167.09	470.92	1,242.36	1,215.40	26.96	46.083		
4,300.00	3,008.00	3,421.54	3,013.66	39.91	14.78	90.32	-181.97	505.96	1,334.83	1,306.30	28.53	46.792		
4,400.00	3,007.77	3,459.62	3,013.73	43.01	16.15	90.31	-196.86	541.00	1,427.30	1,397.28	30.02	47.543		
4,500.00	3,007.54	3,497.69	3,013.80	46.12	17.54	90.30	-211.75	576.05	1,519.77	1,488.35	31.42	48.366		
4,600.00	3,007.31	3,500.00	3,013.81	49.24	17.62	90.30	-212.65	578.17	1,612.63	1,579.59	33.04	48.811		



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 3	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H - Allison Unit #145H - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 156-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		
2,646.00	2,645.78	2,645.97	2,645.80	0.00	0.00	-172.30	27.47	0.00	1.55					
2,700.00	2,699.59	2,699.81	2,699.63	0.15	0.22	-176.04	28.27	0.00	3.94	3.61	0.33	11.972		
2,800.00	2,795.04	2,795.59	2,795.40	0.41	0.62	-178.42	29.76	0.00	31.65	30.69	0.96	33.080		
2,900.00	2,879.30	2,880.48	2,880.28	1.24	0.97	-178.91	31.15	0.00	83.96	81.86	2.10	40.035		
3,000.00	2,946.18	2,948.30	2,948.09	2.96	1.26	-179.09	32.31	0.00	157.08	153.12	3.96	39.659	CC, ES, SF	
3,100.00	2,990.79	2,955.00	2,954.79	5.13	1.28	-178.98	32.43	0.00	248.76	242.91	5.85	42.554		
3,200.00	3,009.88	2,955.00	2,954.79	7.65	1.28	0.10	32.43	0.00	348.37	340.44	7.93	43.907		
3,300.00	3,010.30	2,955.00	2,954.79	10.33	1.28	0.29	32.43	0.00	447.43	437.54	9.89	45.248		
3,400.00	3,010.07	2,955.00	2,954.79	13.08	1.28	0.29	32.43	0.00	546.78	535.11	11.67	46.851		
3,500.00	3,009.84	2,955.00	2,954.79	15.89	1.28	0.29	32.43	0.00	646.32	633.00	13.32	48.521		
3,600.00	3,009.61	2,955.00	2,954.79	18.77	1.28	0.29	32.43	0.00	745.99	731.14	14.86	50.216		
3,700.00	3,009.38	2,955.00	2,954.79	21.70	1.28	0.29	32.43	0.00	845.74	829.45	16.29	51.913		
3,800.00	3,009.15	2,955.00	2,954.79	24.67	1.28	0.29	32.43	0.00	945.54	927.90	17.64	53.599		
3,900.00	3,008.92	2,955.00	2,954.79	27.67	1.28	0.29	32.43	0.00	1,045.38	1,026.46	18.92	55.266		
4,000.00	3,008.69	2,955.00	2,954.79	30.70	1.28	0.29	32.43	0.00	1,145.24	1,125.12	20.12	56.910		
4,100.00	3,008.46	2,955.00	2,954.79	33.75	1.28	0.29	32.43	0.00	1,245.13	1,223.86	21.27	58.529		
4,200.00	3,008.23	2,955.00	2,954.79	36.83	1.28	0.29	32.43	0.00	1,345.03	1,322.66	22.37	60.120		
4,300.00	3,008.00	2,955.00	2,954.79	39.91	1.28	0.29	32.43	0.00	1,444.95	1,421.53	23.43	61.683		
4,400.00	3,007.77	2,955.00	2,954.79	43.01	1.28	0.29	32.43	0.00	1,544.88	1,520.44	24.44	63.219		
4,500.00	3,007.54	2,955.00	2,954.79	46.12	1.28	0.29	32.43	0.00	1,644.82	1,619.41	25.41	64.728		



Anticollision Report



Company:	Hilcorp Energy Company	Local Co-ordinate Reference:	Well Allison Unit #145H
Project:	San Juan County, NM	TVD Reference:	rig @ 6534.00ft
Reference Site:	Allison Unit #145H	MD Reference:	rig @ 6534.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Allison Unit #145H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lat 3	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #2	Offset TVD Reference:	Offset Datum

Offset Design Allison Unit #145H Offsets - Allison Unit #024 - Allison Unit #024 - Allison Unit #024													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		
0.00	0.00	0.00	0.00	0.00	0.00	95.57	-5.99	61.37	61.66					
100.00	100.00	99.90	99.90	0.19	0.18	96.11	-6.15	61.43	61.78	61.42	0.36	171.444		
200.00	199.99	199.88	199.88	0.50	0.60	97.52	-6.53	61.55	62.09	61.00	1.09	57.029		
300.00	299.98	300.12	300.11	0.92	0.95	99.30	-7.15	61.45	62.27	60.40	1.86	33.443		
400.00	399.97	400.15	400.14	1.34	1.26	101.19	-7.87	61.08	62.26	59.67	2.59	24.045		
500.00	499.97	500.00	499.99	1.76	1.59	103.06	-8.54	60.61	62.22	58.88	3.34	18.624		
507.76	507.73	507.92	507.91	1.79	1.62	103.21	-8.60	60.57	62.22	58.82	3.40	18.287		
600.00	599.96	599.71	599.70	2.18	1.95	105.04	-9.41	60.42	62.57	58.44	4.12	15.179		
700.00	699.95	699.77	699.75	2.59	2.34	106.94	-10.41	60.51	63.26	58.34	4.92	12.854		
800.00	799.95	799.69	799.66	3.00	2.72	108.57	-11.33	60.62	63.95	58.23	5.72	11.177		
900.00	899.94	899.70	899.68	3.41	3.11	109.94	-12.18	60.77	64.65	58.13	6.52	9.916		
1,000.00	999.94	999.51	999.48	3.82	3.48	111.09	-13.03	61.05	65.43	58.13	7.30	8.964		
1,100.00	1,099.94	1,099.60	1,099.57	4.24	3.83	112.01	-13.82	61.41	66.24	58.17	8.07	8.209		
1,200.00	1,199.94	1,199.78	1,199.74	4.65	4.23	112.90	-14.57	61.56	66.83	57.95	8.87	7.531		
1,300.00	1,299.94	1,299.79	1,299.75	5.06	4.64	113.83	-15.31	61.55	67.28	57.58	9.70	6.937		
1,400.00	1,399.94	1,399.99	1,399.95	5.48	5.01	114.78	-16.02	61.37	67.59	57.10	10.49	6.446		
1,500.00	1,499.93	1,499.92	1,499.87	5.89	5.37	115.68	-16.64	61.12	67.81	56.55	11.26	6.023		
1,600.00	1,599.93	1,600.03	1,599.98	6.31	5.72	116.55	-17.21	60.85	68.02	56.00	12.03	5.655		
1,700.00	1,699.93	1,699.97	1,699.92	6.73	6.07	117.57	-17.73	60.55	68.31	55.52	12.79	5.340		
1,800.00	1,799.93	1,800.30	1,800.25	7.15	6.31	118.74	-18.05	60.12	68.56	55.11	13.45	5.096		
1,900.00	1,899.92	1,900.52	1,900.46	7.57	6.42	120.08	-18.12	59.35	68.59	54.60	13.99	4.904		
2,000.00	1,999.90	2,001.06	2,001.00	7.99	6.55	121.42	-17.66	58.22	68.23	53.69	14.53	4.695		
2,100.00	2,099.89	2,101.20	2,101.12	8.40	6.72	122.66	-16.78	56.74	67.40	52.28	15.12	4.459		
2,200.00	2,199.88	2,201.24	2,201.14	8.82	6.90	123.95	-15.90	55.07	66.40	50.69	15.71	4.226		
2,300.00	2,299.87	2,300.98	2,300.87	9.23	7.09	125.30	-15.18	53.48	65.53	49.22	16.31	4.017		
2,400.00	2,399.86	2,401.00	2,400.88	9.65	7.28	126.75	-14.68	51.92	64.81	47.89	16.92	3.830		
2,500.00	2,499.85	2,501.24	2,501.10	10.06	7.49	128.24	-14.08	50.14	63.85	46.30	17.55	3.638		
2,600.00	2,599.84	2,601.20	2,601.04	10.47	7.73	129.81	-13.37	48.22	62.77	44.58	18.20	3.450		
2,700.00	2,699.59	2,701.00	2,700.82	10.69	7.98	130.64	-12.62	46.27	61.61	42.96	18.65	3.303		
2,716.59	2,715.92	2,717.32	2,717.13	10.70	8.02	95.64	-12.48	45.95	61.52	42.81	18.71	3.289	CC, ES, SF	
2,800.00	2,795.04	2,796.31	2,796.11	10.78	8.24	115.26	-11.76	44.35	67.31	48.34	18.97	3.548		
2,900.00	2,879.30	2,880.01	2,879.78	11.03	8.47	137.85	-10.96	42.37	102.45	83.06	19.39	5.283		
3,000.00	2,946.18	2,945.35	2,945.09	11.73	8.66	147.06	-10.41	40.53	168.71	148.92	19.79	8.524		
3,100.00	2,990.79	2,987.74	2,987.46	13.06	8.77	143.42	-10.18	39.24	254.82	234.74	20.08	12.693		
3,200.00	3,009.88	3,004.67	3,004.38	15.00	8.82	103.88	-10.11	38.70	351.13	330.92	20.21	17.377		
3,300.00	3,010.30	3,003.06	3,002.77	17.35	8.82	81.58	-10.12	38.75	450.05	429.83	20.22	22.262		
3,400.00	3,010.07	3,000.79	3,000.50	19.94	8.81	79.41	-10.12	38.82	549.35	529.13	20.22	27.172		
3,500.00	3,009.84	3,000.00	2,999.71	22.68	8.81	78.65	-10.13	38.85	648.86	628.64	20.23	32.080		
3,600.00	3,009.61	2,996.48	2,996.19	25.53	8.80	75.37	-10.14	38.96	748.49	728.27	20.22	37.012		
3,700.00	3,009.38	2,994.38	2,994.10	28.46	8.79	73.46	-10.15	39.03	848.21	827.98	20.23	41.934		
3,800.00	3,009.15	2,992.31	2,992.03	31.44	8.79	71.62	-10.16	39.09	947.98	927.75	20.23	46.854		
3,900.00	3,008.92	2,990.27	2,989.99	34.46	8.78	69.84	-10.17	39.16	1,047.79	1,027.55	20.24	51.769		
4,000.00	3,008.69	2,988.25	2,987.97	37.51	8.78	68.13	-10.17	39.22	1,147.63	1,127.38	20.25	56.678		
4,100.00	3,008.46	2,986.26	2,985.98	40.58	8.77	66.48	-10.18	39.28	1,247.49	1,227.23	20.26	61.578		
4,200.00	3,008.23	2,984.30	2,984.02	43.67	8.76	64.89	-10.19	39.34	1,347.37	1,327.10	20.27	66.470		
4,300.00	3,008.00	2,982.36	2,982.08	46.78	8.76	63.37	-10.20	39.40	1,447.26	1,426.97	20.28	71.350		
4,400.00	3,007.77	2,980.44	2,980.16	49.90	8.75	61.90	-10.21	39.46	1,547.16	1,526.86	20.30	76.219		
4,500.00	3,007.54	2,978.55	2,978.27	53.02	8.75	60.50	-10.22	39.52	1,647.07	1,626.76	20.32	81.074		

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 #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H Offsets - Allison Unit #061 - Allison Unit #061 - Allison Unit #061													Offset Site Error:	0.00 ft
Survey Program: 211-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		
4,700.00	3,007.08	2,982.38	2,982.07	59.30	11.96	-88.19	2,868.22	1,900.15	1,649.15	1,610.72	38.43	42.913		
4,800.00	3,006.85	2,983.29	2,982.97	62.45	11.96	-88.27	2,868.23	1,900.15	1,558.74	1,517.74	41.00	38.020		
4,900.00	3,006.62	2,984.19	2,983.88	65.61	11.96	-88.35	2,868.25	1,900.15	1,469.56	1,425.65	43.91	33.470		
5,000.00	3,006.39	2,985.10	2,984.78	68.77	11.97	-88.42	2,868.26	1,900.15	1,381.87	1,334.66	47.20	29.275		
5,100.00	3,006.17	2,986.00	2,985.69	71.93	11.97	-88.50	2,868.28	1,900.15	1,295.96	1,245.02	50.94	25.441		
5,200.00	3,005.94	2,986.91	2,986.59	75.09	11.98	-88.57	2,868.29	1,900.15	1,212.21	1,157.03	55.18	21.970		
5,300.00	3,005.71	2,987.81	2,987.50	78.26	11.98	-88.65	2,868.31	1,900.15	1,131.10	1,071.13	59.97	18.861		
5,400.00	3,005.48	2,988.72	2,988.41	81.43	11.98	-88.73	2,868.32	1,900.15	1,053.25	987.87	65.38	16.108		
5,500.00	3,005.25	2,989.63	2,989.31	84.61	11.99	-88.80	2,868.34	1,900.15	979.43	907.97	71.46	13.706		
5,600.00	3,005.02	2,990.54	2,990.22	87.78	11.99	-88.88	2,868.35	1,900.15	910.61	832.42	78.20	11.645		
5,700.00	3,004.79	2,991.45	2,991.13	90.96	11.99	-88.95	2,868.37	1,900.15	848.03	762.50	85.53	9.915		
5,800.00	3,004.56	2,992.36	2,992.04	94.14	12.00	-89.03	2,868.38	1,900.15	793.15	699.87	93.28	8.503		
5,900.00	3,004.33	2,993.27	2,992.95	97.32	12.00	-89.11	2,868.40	1,900.15	747.68	646.60	101.08	7.397		
6,000.00	3,004.10	2,994.18	2,993.86	100.50	12.01	-89.18	2,868.41	1,900.15	713.41	605.02	108.39	6.582		
6,043.31	3,004.00	2,994.57	2,994.26	101.88	12.01	-89.22	2,868.42	1,900.15	702.48	591.24	111.24	6.315 CC, ES, SF		



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H Offsets - Allison Unit #061m - Allison Unit #061m - Allison Unit #061m												Offset Site Error:	0.00 ft
Survey Program: 245-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
3,000.00	2,946.18	2,922.44	2,922.08	11.73	11.83	-56.01	1,772.60	233.54	1,634.91	1,611.81	23.11	70.753	
3,100.00	2,990.79	2,970.39	2,970.02	13.06	12.02	-70.03	1,773.27	233.54	1,569.18	1,545.15	24.02	65.317	
3,200.00	3,009.88	2,991.39	2,991.02	15.00	12.11	-85.83	1,773.54	233.54	1,499.53	1,474.24	25.29	59.288	
3,300.00	3,010.30	2,992.76	2,992.39	17.35	12.11	-89.16	1,773.56	233.54	1,431.66	1,404.70	26.96	53.101	
3,400.00	3,010.07	2,993.44	2,993.07	19.94	12.12	-89.20	1,773.57	233.54	1,367.72	1,338.62	29.10	47.005	
3,500.00	3,009.84	2,994.11	2,993.74	22.68	12.12	-89.23	1,773.58	233.54	1,308.31	1,276.64	31.66	41.321	
3,600.00	3,009.61	2,994.79	2,994.42	25.53	12.12	-89.27	1,773.59	233.54	1,254.06	1,219.46	34.60	36.243	
3,700.00	3,009.38	2,995.46	2,995.09	28.46	12.12	-89.31	1,773.59	233.54	1,205.69	1,167.83	37.86	31.849	
3,800.00	3,009.15	2,996.12	2,995.75	31.44	12.13	-89.34	1,773.60	233.54	1,163.91	1,122.56	41.35	28.146	
3,900.00	3,008.92	2,996.79	2,996.42	34.46	12.13	-89.38	1,773.61	233.54	1,129.46	1,084.46	45.00	25.098	
4,000.00	3,008.69	2,997.45	2,997.08	37.51	12.13	-89.41	1,773.62	233.54	1,103.04	1,054.34	48.70	22.651	
4,100.00	3,008.46	2,998.11	2,997.74	40.58	12.14	-89.45	1,773.63	233.54	1,085.22	1,032.90	52.32	20.743	
4,200.00	3,008.23	2,998.76	2,998.39	43.67	12.14	-89.48	1,773.64	233.54	1,076.43	1,020.69	55.74	19.310	
4,244.99	3,008.13	2,999.06	2,998.69	45.07	12.14	-89.50	1,773.64	233.54	1,075.49	1,018.30	57.19	18.804 CC	
4,300.00	3,008.00	2,999.41	2,999.04	46.78	12.14	-89.52	1,773.64	233.54	1,076.90	1,018.03	58.87	18.294 ES	
4,400.00	3,007.77	3,000.06	2,999.69	49.90	12.14	-89.55	1,773.65	233.54	1,086.60	1,025.01	61.60	17.641	
4,500.00	3,007.54	3,000.71	3,000.34	53.02	12.15	-89.59	1,773.66	233.54	1,105.31	1,041.43	63.88	17.303	
4,600.00	3,007.31	3,001.35	3,000.98	56.16	12.15	-89.62	1,773.67	233.54	1,132.57	1,066.86	65.71	17.237 SF	
4,700.00	3,007.08	3,001.99	3,001.62	59.30	12.15	-89.65	1,773.68	233.54	1,167.78	1,100.69	67.09	17.407	
4,800.00	3,006.85	3,002.63	3,002.26	62.45	12.15	-89.69	1,773.68	233.54	1,210.25	1,142.18	68.07	17.781	
4,900.00	3,006.62	3,003.27	3,002.89	65.61	12.16	-89.72	1,773.69	233.54	1,259.25	1,190.55	68.70	18.330	
5,000.00	3,006.39	3,003.90	3,003.53	68.77	12.16	-89.75	1,773.70	233.54	1,314.04	1,245.00	69.04	19.033	
5,100.00	3,006.17	3,004.53	3,004.15	71.93	12.16	-89.79	1,773.71	233.54	1,373.93	1,304.78	69.15	19.867	
5,200.00	3,005.94	3,005.15	3,004.78	75.09	12.16	-89.82	1,773.71	233.54	1,438.29	1,369.20	69.09	20.818	
5,300.00	3,005.71	3,005.77	3,005.40	78.26	12.17	-89.85	1,773.72	233.54	1,506.55	1,437.66	68.89	21.869	
5,400.00	3,005.48	3,006.40	3,006.02	81.43	12.17	-89.89	1,773.73	233.54	1,578.19	1,509.59	68.59	23.008	
5,500.00	3,005.25	3,007.01	3,006.64	84.61	12.17	-89.92	1,773.74	233.54	1,652.78	1,584.55	68.23	24.224	



Anticollision Report



Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 #145H Offsets - Allison Unit #061N - Allison Unit #061N - Allison Unit #061N													Offset Site Error:	0.00 ft
Survey Program: 263-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		
4,700.00	3,007.08	3,663.10	3,435.12	59.30	33.83	124.72	1,889.25	2,768.83	1,618.39	1,574.51	43.88	36.882		
4,800.00	3,006.85	3,649.91	3,422.44	62.45	33.72	123.82	1,889.62	2,772.46	1,530.64	1,484.72	45.92	33.334		
4,900.00	3,006.62	3,636.36	3,409.44	65.61	33.61	122.89	1,889.96	2,776.27	1,444.27	1,396.00	48.28	29.916		
5,000.00	3,006.39	3,623.00	3,396.65	68.77	33.51	121.96	1,890.27	2,780.11	1,359.56	1,308.55	51.01	26.655		
5,100.00	3,006.17	3,603.68	3,378.18	71.93	33.34	120.59	1,890.68	2,785.76	1,276.76	1,222.57	54.19	23.561		
5,200.00	3,005.94	3,584.78	3,360.13	75.09	33.17	119.22	1,891.08	2,791.35	1,196.25	1,138.35	57.89	20.663		
5,300.00	3,005.71	3,565.58	3,341.81	78.26	33.01	117.82	1,891.47	2,797.09	1,118.49	1,056.27	62.22	17.978		
5,400.00	3,005.48	3,546.78	3,323.90	81.43	32.84	116.42	1,891.84	2,802.77	1,044.10	976.85	67.25	15.525		
5,500.00	3,005.25	3,527.92	3,305.95	84.61	32.67	114.99	1,892.19	2,808.55	973.86	900.75	73.12	13.320		
5,600.00	3,005.02	3,508.69	3,287.67	87.78	32.50	113.53	1,892.52	2,814.53	908.72	828.83	79.90	11.374		
5,700.00	3,004.79	3,488.88	3,268.87	90.96	32.32	112.00	1,892.85	2,820.77	849.84	762.22	87.62	9.699		
5,800.00	3,004.56	3,468.05	3,249.14	94.14	32.12	110.38	1,893.23	2,827.43	798.56	702.38	96.18	8.303		
5,900.00	3,004.33	3,446.36	3,228.62	97.32	31.92	108.68	1,893.67	2,834.47	756.39	651.14	105.25	7.187		
6,000.00	3,004.10	3,423.86	3,207.39	100.50	31.70	106.91	1,894.19	2,841.87	724.87	610.60	114.28	6.343		
6,043.31	3,004.00	3,414.02	3,198.10	101.88	31.61	106.13	1,894.41	2,845.13	714.90	596.91	117.98	6.059	CC, ES, SF	

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



Anticollision Report



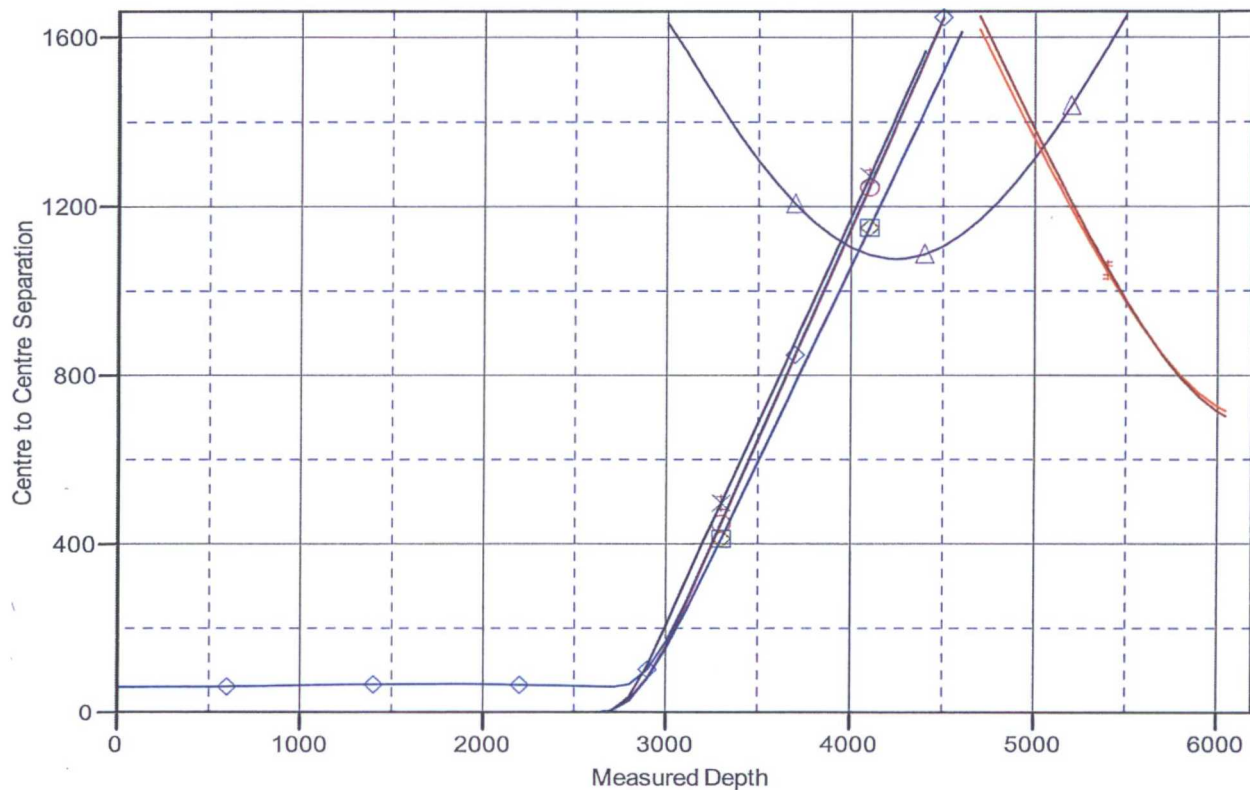
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference: Well Allison Unit #145H
TVD Reference: rig @ 6534.00ft
MD Reference: rig @ 6534.00ft
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 @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Ladder Plot



LEGEND

061m, Allison Unit #061m, Allison Unit #061m V0 Allison Unit #061, Allison Unit #061, Allison Unit #061 V0 Allison Unit #145H, Lat 2 ST01, Design #2
024, Allison Unit #024, Allison Unit #024 V0 Allison Unit #145H, Lat 1, Design #1 V0 Allison Unit #145H, Lat 2, Design #3 V0
061N, Allison Unit #061N, Allison Unit #061N V0 Allison Unit #145H, OH, OH V0 Allison Unit #145H, Lat 1 ST01, Design #1



Anticollision Report



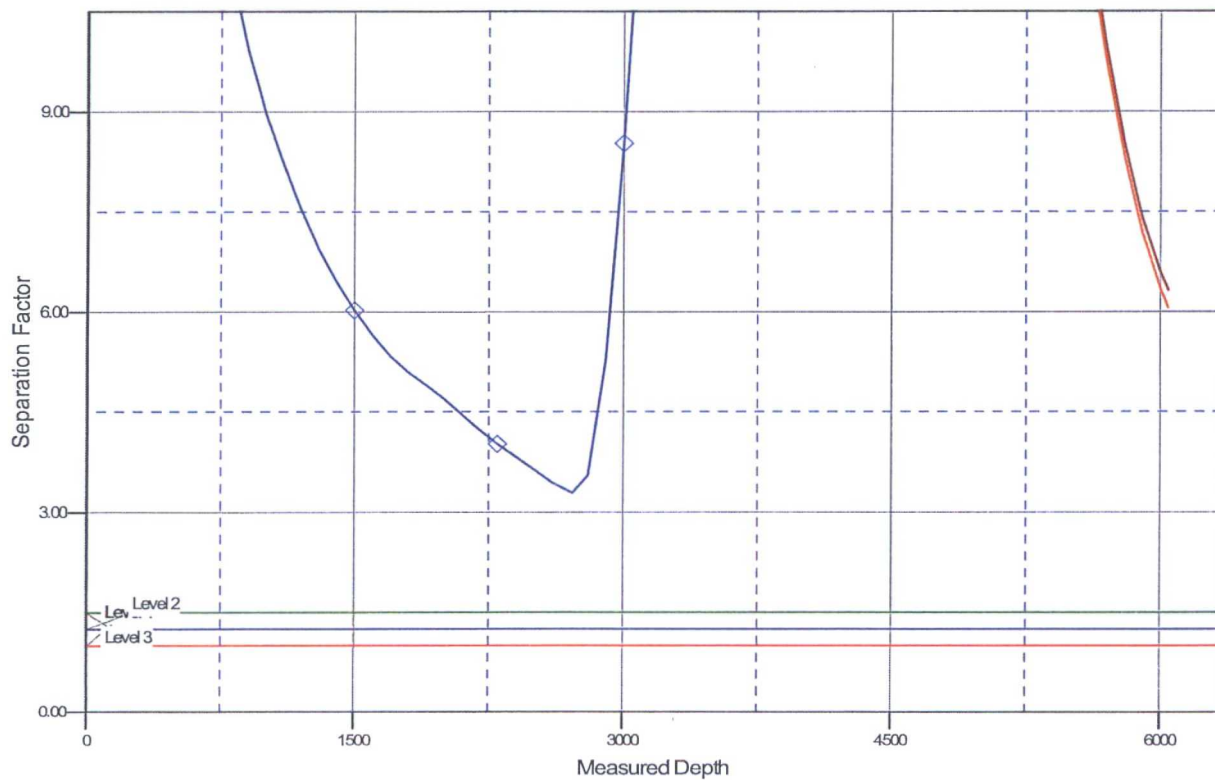
Company: Hilcorp Energy Company
Project: San Juan County, NM
Reference Site: Allison Unit #145H
Site Error: 0.00 ft
Reference Well: Allison Unit #145H
Well Error: 0.00 ft
Reference Wellbore: Lat 3
Reference Design: Design #2

Local Co-ordinate Reference:
TVD Reference: Well Allison Unit #145H
MD Reference: rig @ 6534.00ft
North Reference: rig @ 6534.00ft
Survey Calculation Method: Grid
Output errors are at: Minimum Curvature
Database: 2.00 sigma
Offset TVD Reference: EDM 5000.1 Single User Db
Offset Datum: Offset Datum

Reference Depths are relative to rig @ 6534.00ft
Offset Depths are relative to Offset Datum
Central Meridian is 107° 50' 0.000 W

Coordinates are relative to: Allison Unit #145H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico West 30
Grid Convergence at Surface is: 0.20°

Separation Factor Plot



LEGEND

061m, Allison Unit #061m, Allison Unit #061m V0 Allison Unit #061, Allison Unit #061, Allison Unit #061 V0 Allison Unit #145H, Lat 2 ST01, Design #2
024, Allison Unit #024, Allison Unit #024 V0 Allison Unit #145H, Lat 1, Design #1 V0 Allison Unit #145H, Lat 2, Design #3 V0
061N, Allison Unit #061N, Allison Unit #061N V0 Allison Unit #145H, OH, OH V0 Allison Unit #145H, Lat 1 ST01, Design #1



Allison Unit #145H ST Planned Well Schematic

