

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division



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

Operator Signature Date: 6/20/2018

Well information;

Operator Hilcorp, Well Name and Number Sandwich 29-64 Unit Com 601
1H

API# 39-31369, Section 8, Township 29 N/S, Range 6 E/W

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

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

Brandon Powell

NMOCD Approved by Signature

9-28-18

Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

5. Lease Serial No.
NMSF0080379A

6. If Indian, Allottee or Tribe Name

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

8. Lease Name and Well No.
SAN JUAN 29-6 UNIT COM 601 1H

9. API Well No.

10. Field and Pool, or Exploratory
MANCOS / BASIN MANCOS

11. Sec., T. R. M. or Blk and Survey or Area
SEC 8 / T29N / R6W / NMP

12. County or Parish
RIO ARRIBA

13. State
NM

1a. Type of work: ☒ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

2. Name of Operator
HILCORP ENERGY COMPANY

3a. Address
1111 Travis Street Houston TX 77002

3b. Phone No. (include area code)
(713)209-2400

4. Location of Well (Report location clearly and in accordance with any State requirements.)*

At surface SWNW / 2579 FNL / 18 FWL / LAT 36.740362 / LONG -107.495272

At proposed prod. zone SWNE / 2391 FNL / 2597 FEL / LAT 36.740847 / LONG -107.468122

14. Distance in miles and direction from nearest town or post office*
36 miles

15. Distance from proposed*
location to nearest
property or lease line, ft.
(Also to nearest drig. unit line, if any)
18 feet

16. No. of acres in lease
1438.6

17. Spacing Unit dedicated to this well
640

18. Distance from proposed location*
to nearest well, drilling, completed, 380 feet
applied for, on this lease, ft.

19. Proposed Depth
7329 feet / 15100 feet

20. BLM/BIA Bond No. on file
FED: NMB001486

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6782 feet

22. Approximate date work will start*
10/01/2018

23. Estimated duration
122 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

1. Well plat certified by a registered surveyor.

2. A Drilling Plan.

3. A Surface Use Plan (if the location is on National Forest System Lands, the
SUPO must be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see
Item 20 above).

5. Operator certification

6. Such other site specific information and/or plans as may be required by the
BLM.

25. Signature
(Electronic Submission)

Name (Printed Typed)
Tammy Jones / Ph: (505)324-5185

Date
06/20/2018

Title
Sr. Operations/Regulatory Tech

Approved by (Signature)

Name (Printed Typed)

Richard A Fields

Date

9-25-18

Title
Field Manager

Office
FARMINGTON

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

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

(Continued on page 2)

*(Instructions on page 2)

SEP 25 2018

DISTRICT III

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

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

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

NMOCD PV

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

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

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

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

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-039- 31369		*Pool Code 97232	*Pool Name BASIN MANCOS
*Property Code 322485	*Property Name SAN JUAN 29-6 UNIT COM 601		*Well Number 1H
*GRID No. 372171	*Operator Name HILCORP ENERGY COMPANY		*Elevation 6782'

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
E	8	29N	6W		2579	NORTH	18	WEST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	9	29N	6W		2391	NORTH	2597	EAST	RIO ARriba

¹² Dedicated Acres 640.00	N/2 - Section 8 N/2 - Section 9	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

SURFACE LOCATION
2579' FNL 18' FWL
SEC 8, T29N, R6W
LAT: 36.740356°N
LONG: 107.494657°W
DATUM: NAD1927
LAT: 36.740362°N
LONG: 107.495272°W
DATUM: NAD1983

PROPOSED PILOT HOLE
2374' FNL 42' FWL
SEC 8, T29N, R6W
LAT: 36.740919°N
LONG: 107.494587°W
DATUM: NAD1927
LAT: 36.740926°N
LONG: 107.495192°W
DATUM: NAD1983

LANDING POINT / POE
2374' FNL 502' FWL
SEC 8, T29N, R6W
LAT: 36.740921°N
LONG: 107.493014°W
DATUM: NAD1927
LAT: 36.740927°N
LONG: 107.493619°W
DATUM: NAD1983

PROPOSED BOTTOM HOLE
2391' FNL 2597' FEL
SEC 9, T29N, R6W
LAT: 36.740840°N
LONG: 107.467518°W
DATUM: NAD1927
LAT: 36.740847°N
LONG: 107.468122°W
DATUM: NAD1983

¹⁷ OPERATOR CERTIFICATION

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

Tammy Jones 6/11/2018
Signature Date
TAMMY JONES
Printed Name
tajones@hilcorp.com
E-mail Address

¹⁸ SURVEYOR CERTIFICATION

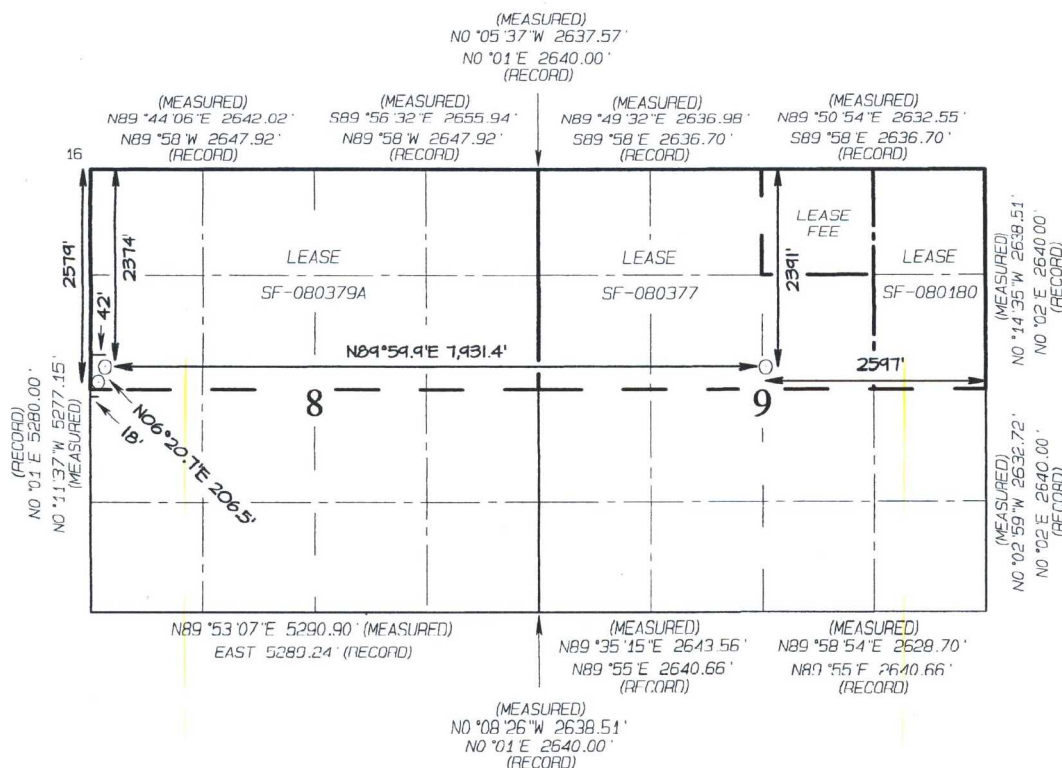
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: JUNE 7, 2018
Survey Date: JANUARY 5, 2018

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269



Hilcorp Energy Company**Technical Plan****1. Location**

SAN JUAN 29-6 UNIT COM 601 1H

SHL: 2579' FNL, 18' FWL -- T 29N, R 6W, Sec 8

BHL: 2391' FNL, 2597' FEL -- T 29N, R 6W, Sec 9

GL: 6782'

2. Geological Markers

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

Formation	Depth (TVD)	Remarks
San Jose	Surface	Wet
Ojo Alamo	2724'	Wet
Kirtland	2889'	Possible Gas/Water
Fruitland	3424'	Possible Gas/Water
Pictured Cliffs	3669'	Wet
Lewis Shale	3749'	
Massive Cliffhouse	5332'	Possible Gas/Water
Menefee	5531'	Possible Gas/Water
Point Lookout	5867'	Possible Gas/Water
Mancos	6273'	Oil/Gas
Mancos Lateral Target	6958'	Oil/Gas
Greenhorn – Pilot Hole	7860'	
TD of Pilot Hole	8000'	

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

3. Pressure Control Equipment

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

- BOPE will be nipped up on top of wellhead after surface casing is set and cemented.
- Pressure control configuration will be designed to meet and exceed 5M standards.
- All equipment will have 5M 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				
Casing	Hole Size	Casing Size	Weight/Grade	Depth
Surface	17-1/2"	13-3/8"	54.5#, J-55, BTC, New	0' - 340' (MD)
Intermediate	12-1/4"	9-5/8"	40.0#, P-110, BTC, New	0' - 6378' (MD)
Production	8-3/4"	5-1/2"	20.0#, P-110, BTC, New	0' - 15100' (MD)

The production casing will be run from total MD to surface. If the 8-3/4" hole is not drilled to total MD, the production casing setting depth and length will be adjusted accordingly. A toe initiation sliding sleeve will be installed at the toe of the production casing.

B) The proposed cement program is shown below:

Cement Program						
Interval	Depth (MD)	Sacks	Slurry	Excess	Volume	Planned Cement Top
Surface	340'	460	Lead Cmt: Premium Cement 2% CaCl, 0.125 lb/sk Poley E flake 1.175 ft ³ /sk -- 5.14 gal/sk, 15.8 ppg	100%	540 ft ³	Surface
Intermediate	5000'	991	Lead Cmt: Halcem Sytem 0.3% HR-5, 0.125 lb/sk Poly E flake, 1.974 ft ³ /sk -- 10.28 gal/sk, 12.3 ppg	25%	1957 ft ³	Surface
	6378'	442	Tail Cmt: Varicem Cement 0.1% HR-5, 0.125 lb/sk Poly E flake, 1.295 ft ³ /sk -- 5.69 gal/sk, 13.5 ppg	25%	572 ft ³	5000'
Production	15100'	2082	Tail Cmt: Bondcem 0.3% Super CBL, 0.1% HR -601, 6.08 gal/sk FW. 13.3 ppg, 1.356 ft ³ /sk	10%	2823 ft ³	5000'

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

C) The proposed centralizer program is shown below:

Centralizer Program	
Interval	Centralizers
Surface	1 per joint on bottom 3 joints
Intermediate	1 above intermediate shoe joint with collar clamp 1 every 3 rd joint to surface
Production	1 per joint in horizontal section of production interval 1 every 3 rd joint in vertical section of production interval

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

5. Drilling Fluids

A) The proposed drilling fluid program is outlined below:

Mud Program					
Interval	Mud Type	Weight (ppg)	Fluid Loss (cc)	Invert Ratio (Diesel/Brine)	Depth (MD)
Surface	Water / Gel System	8.3 - 9.2	NC		0-340'
Intermediate	LSND / Gel system	8.4 - 10	<6		340 – 6378'
Pilot Hole	LSND / Gel system	9 - 11	<6		6378' – 8000'
Production	Oil Based Mud	10 - 12	6-8	70/30 – 75/25	6378 – 15100'

Oil based mud will be an Invert Mud. Base fluid will be diesel. Brine fluid will be CaCl or KCl.

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

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



6. Abnormal Pressures & Hazards

- No over-pressured intervals expected.
- Estimated Reservoir Pressure = 3012 psi. (Based on a pore pressure gradient of 0.43 psi/ft from layer pressure tests of Mancos formation in offset well)
- There is some offset Fruitland Coal, Mesa Verde, and Picture Cliffs production within the area which could result in these respective formations being under pressured.
- No hydrogen sulfide gas is expected based on nearby well production.

7. Pilot Hole

- Pilot Hole will be drilled through Mancos Section from intermediate casing at 6378' MD to planned TD of 8000'
- Whole core, sidewall cores, and Openhole logs are planned in the pilot hole section.
- After coring and Openhole logging have been completed, three cement plugs with viscous gel spacers will be pumped and the top of cement will be at ~6000'. Will utilize cement plugs to kick off and begin drilling production interval.
- Plug 1 will be from TD to ~7300'. The second plug will be from 7300- 6600'. The third plug will be from 6600-6000'.

8. Testing, Logging, Coring

- Mud Logs: Mud loggers will be rigged up from KOP to production hole TD.
- MWD: Directional tools from KOP to production hole TD.
- LWD: Gamma Ray will be utilized in production hole for well placement.
- Core: Whole Core and Sidewall Cores planned in Pilot Hole section of well
- Logs: Triple Combo, Dipole Sonic, and image log planned in the Pilot Hole Section of well
- Cased Hole Logs: A Temp Survey or CBL will be ran on the intermediate hole if cement is not circulated to surface during intermediate cement job.

9. Directional Plan

The planned wellbore directional plan and plot is attached.

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



10. Completion

a) Pressure Test

- Pressure test 5-1/2" production casing to allowable frac pressure. Hold test for 30 minutes. Cycle pressure to activate toe sleeve

b) Stimulation

- Stimulate with approximately 19,000,000 pounds of proppant in 400,000 bbls of water; the number of stages and amount of proppant will be adjusted based on real-time pumping conditions during the stimulation
- Stages will be perforated using wireline and isolated using frac plugs
- Plugs will be drilled out and stimulation fluid will be flowed back

c) Running Tubing

- Production tubing will be run and landed at the top of the horizontal section of the well

San Juan 29-6 Unit Com 601 1H - Pilot Hole Schematic

Sand/Csg	MD	TVD	Hole Size	MAASP	147 psi
13-3/8"	340	340	17.5	TOC=0'	
Fruitland	3427	3424	12.25	TOC= 0'	
Cliffhouse	5337	5332			
Menefee	5537	5531			
Mancos	6278	6273			
9-5/8"	6378	6373	MAASP	2751 psi	
plug 3 f/ 6600' - 6000': 251 cuft (17 ppg, .99 cuft/sx) 253 sxs Granitecem system (.3% HR-5, .3% CFR -3) plug 2 f/ 7300' - 6600': 368 cuft (15.8 ppg, 1.15 cuft/sx) 320 sxs Premium Cement (.2% HR-5, .15% CFR -3) plug 1 f/ 8000'-7300': 368 cuft (15.8 ppg, 1.15 cuft/sx) 320 sxs Premium Cement (.2% HR-5, .15% CFR -3)					
Greenhorn	7866	7860			
Pilot hole TD -	8000	7994			

						Design Factors			
	Size	Wt	Depth	Grade	Cxn		Collapse	Burst	Tension
Surface	13.375	54.5	340	J55	BTC	Rating	1130	2740	514000
						SF	6.73	15.83	4.34
Int	9.625	40.0	6378	P110	BTC	Rating	3470.00	7910.00	988000.00
						SF	1.10	2.51	2.78

					Displacement BPF	
Csg	ID	Drift	Capacity (bpf)		Closed end	Open end
Surface	12.615	12.46	0.1546		0.1738	0.0192
Int	8.835	8.679	0.0758		0.0900	0.0142



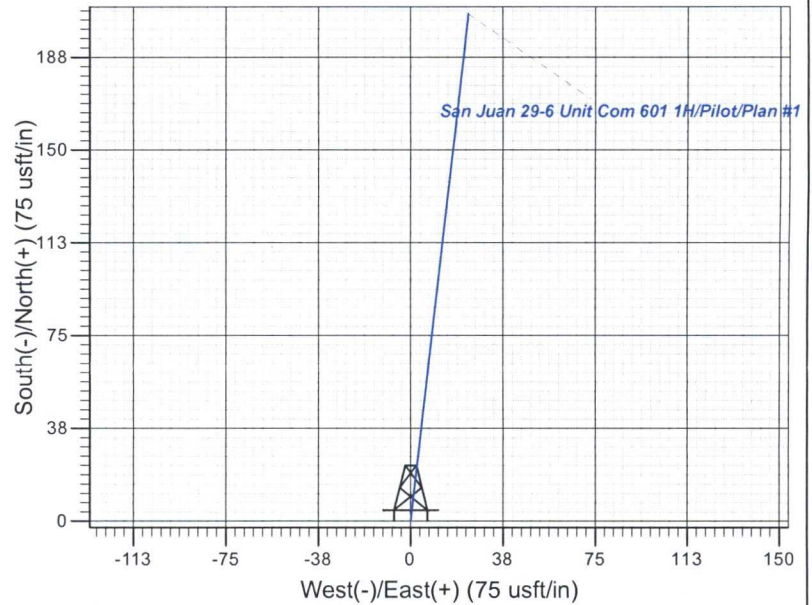
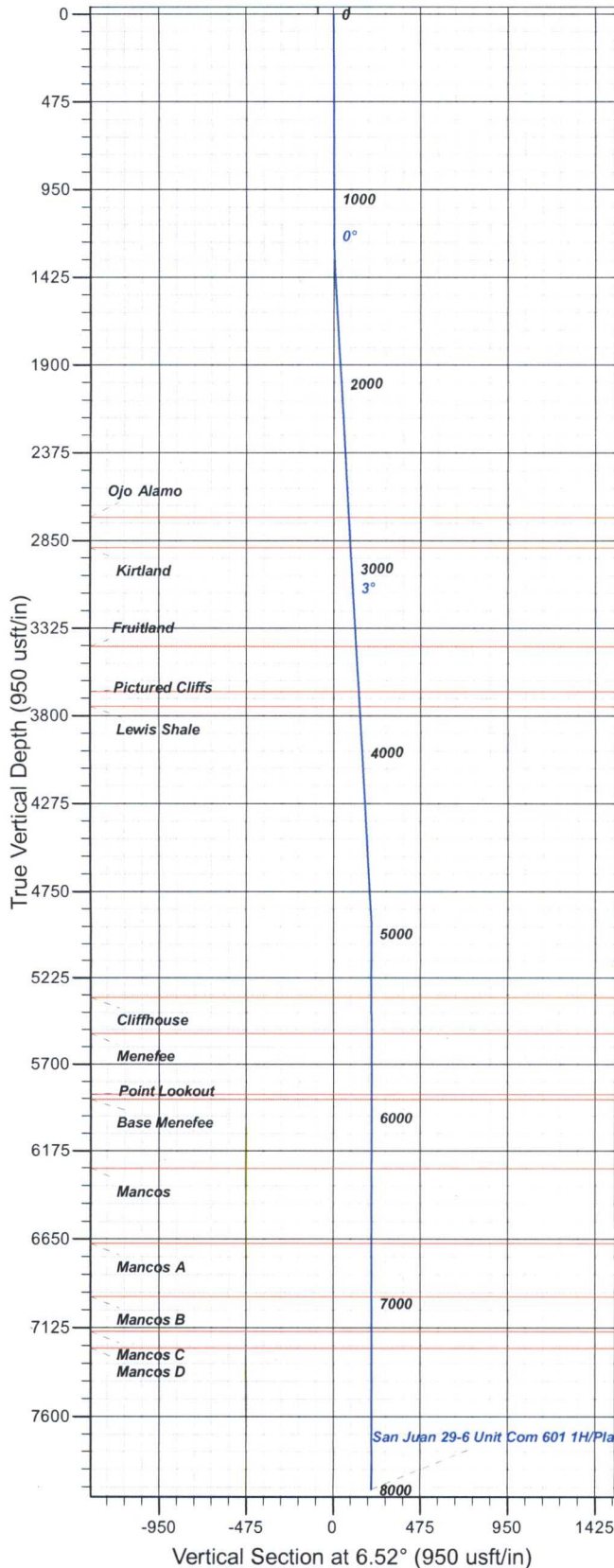
Company: Hilcorp Energy Corp.
Project: Rio Arriba, NM NAD27
Site: San Juan 29-6 Pad
Well: San Juan 29-6 Unit Com 601 1H



Well Details: San Juan 29-6 Unit Com 601 1H

+N/-S 0.00 +E/-W 0.00 Northing 2088921.13 Easting 599231.13 Latitude 36.7403560 Longitude -107.4946670 Slot

T M Azimuths to True North
Magnetic North: 8.97°
Magnetic Field
Strength: 49889.1snT
Dip Angle: 63.33°
Date: 5/23/2018
Model: HDGM



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2724.00	2726.28	Ojo Alamo
2889.00	2891.54	Kirtland
3424.00	3427.40	Fruitland
3669.00	3672.80	Pictured Cliffs
3749.00	3752.93	Lewis Shale
5332.00	5337.77	Cliffhouse
5531.00	5536.77	Menefee
5867.00	5872.77	Point Lookout
5895.00	5900.77	Base Menefee
6273.00	6278.77	Mancos
6675.00	6680.77	Mancos A
6958.00	6963.77	Mancos B
7144.00	7149.77	Mancos C
7234.00	7239.77	Mancos D

Plan: Plan #1

10:43, June 06 2018
Created By: Janie Collins

PROJECT DETAILS: Rio Arriba, NM NAD27

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

System Datum: Mean Sea Level

CASING DETAILS

No casing data is available

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	
3	1362.41	3.25	6.52	1362.33	4.57	0.52	2.00	6.52	4.60	
4	4843.35	3.25	6.52	4837.67	200.54	22.92	0.00	0.00	201.84	
5	5005.77	0.00	0.00	5000.00	205.11	23.44	2.00	180.00	206.45	
6	8000.00	0.00	0.00	7994.23	205.11	23.44	0.00	0.00	206.45	

DESIGN TARGET DETAILS

No target data is available.



Hilcorp Energy Corp.

Rio Arriba, NM NAD27

San Juan 29-6 Pad

San Juan 29-6 Unit Com 601 1H

Pilot

Plan: Plan #1

Standard Planning Report

06 June, 2018



Scientific Drilling

www.scientificdrilling.com





Scientific Drilling, Intl
Planning Report



Database: Grand Junction District
Company: Hilcorp Energy Corp.
Project: Rio Arriba, NM NAD27
Site: San Juan 29-6 Pad
Well: San Juan 29-6 Unit Com 601 1H
Wellbore: Pilot
Design: Plan #1

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
MD Reference: GL 6782' & RKB 20' @ 6802.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

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

Site	San Juan 29-6 Pad				
Site Position:		Northing:	2,088,921.13 usft	Latitude:	36.7403560
From:	Lat/Long	Easting:	599,231.13 usft	Longitude:	-107.4946670
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.20 °

Well	San Juan 29-6 Unit Com 601 1H					
Well Position	+N/-S	0.00 usft	Northing:	2,088,921.13 usft	Latitude:	36.7403560
	+E/-W	0.00 usft	Easting:	599,231.13 usft	Longitude:	-107.4946670
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,782.00 usft

Wellbore	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/23/2018	8.97	63.33	49,889

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	6.52

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,362.41	3.25	6.52	1,362.33	4.57	0.52	2.00	2.00	0.00	6.52	
4,843.35	3.25	6.52	4,837.67	200.54	22.92	0.00	0.00	0.00	0.00	
5,005.77	0.00	0.00	5,000.00	205.11	23.44	2.00	-2.00	0.00	180.00	
8,000.00	0.00	0.00	7,994.23	205.11	23.44	0.00	0.00	0.00	0.00	



Scientific Drilling, Intl

Planning Report



Database: Grand Junction District
 Company: Hilcorp Energy Corp.
 Project: Rio Arriba, NM NAD27
 Site: San Juan 29-6 Pad
 Well: San Juan 29-6 Unit Com 601 1H
 Wellbore: Pilot
 Design: Plan #1

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
 TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
 MD Reference: GL 6782' & RKB 20' @ 6802.00usft
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	2.00	6.52	1,299.98	1.73	0.20	1.75	2.00	2.00	0.00
1,362.41	3.25	6.52	1,362.33	4.57	0.52	4.60	2.00	2.00	0.00
1,400.00	3.25	6.52	1,399.85	6.69	0.76	6.73	0.00	0.00	0.00
1,500.00	3.25	6.52	1,499.69	12.32	1.41	12.40	0.00	0.00	0.00
1,600.00	3.25	6.52	1,599.53	17.95	2.05	18.06	0.00	0.00	0.00
1,700.00	3.25	6.52	1,699.37	23.58	2.69	23.73	0.00	0.00	0.00
1,800.00	3.25	6.52	1,799.21	29.21	3.34	29.40	0.00	0.00	0.00
1,900.00	3.25	6.52	1,899.05	34.84	3.98	35.06	0.00	0.00	0.00
2,000.00	3.25	6.52	1,998.89	40.47	4.62	40.73	0.00	0.00	0.00
2,100.00	3.25	6.52	2,098.73	46.10	5.27	46.40	0.00	0.00	0.00
2,200.00	3.25	6.52	2,198.57	51.73	5.91	52.06	0.00	0.00	0.00
2,300.00	3.25	6.52	2,298.41	57.36	6.55	57.73	0.00	0.00	0.00
2,400.00	3.25	6.52	2,398.25	62.99	7.20	63.40	0.00	0.00	0.00
2,500.00	3.25	6.52	2,498.09	68.61	7.84	69.06	0.00	0.00	0.00
2,600.00	3.25	6.52	2,597.92	74.24	8.48	74.73	0.00	0.00	0.00
2,700.00	3.25	6.52	2,697.76	79.87	9.13	80.39	0.00	0.00	0.00
2,726.28	3.25	6.52	2,724.00	81.35	9.30	81.88	0.00	0.00	0.00
Ojo Alamo									
2,800.00	3.25	6.52	2,797.60	85.50	9.77	86.06	0.00	0.00	0.00
2,891.54	3.25	6.52	2,889.00	90.66	10.36	91.25	0.00	0.00	0.00
Kirtland									
2,900.00	3.25	6.52	2,897.44	91.13	10.41	91.73	0.00	0.00	0.00
3,000.00	3.25	6.52	2,997.28	96.76	11.06	97.39	0.00	0.00	0.00
3,100.00	3.25	6.52	3,097.12	102.39	11.70	103.06	0.00	0.00	0.00
3,200.00	3.25	6.52	3,196.96	108.02	12.34	108.73	0.00	0.00	0.00
3,300.00	3.25	6.52	3,296.80	113.65	12.99	114.39	0.00	0.00	0.00
3,400.00	3.25	6.52	3,396.64	119.28	13.63	120.06	0.00	0.00	0.00
3,427.40	3.25	6.52	3,424.00	120.82	13.81	121.61	0.00	0.00	0.00
Fruitland									
3,500.00	3.25	6.52	3,496.48	124.91	14.27	125.72	0.00	0.00	0.00
3,600.00	3.25	6.52	3,596.32	130.54	14.92	131.39	0.00	0.00	0.00
3,672.80	3.25	6.52	3,669.00	134.64	15.39	135.52	0.00	0.00	0.00
Pictured Cliffs									
3,700.00	3.25	6.52	3,696.16	136.17	15.56	137.06	0.00	0.00	0.00
3,752.93	3.25	6.52	3,749.00	139.15	15.90	140.06	0.00	0.00	0.00
Lewis Shale									
3,800.00	3.25	6.52	3,796.00	141.80	16.20	142.72	0.00	0.00	0.00
3,900.00	3.25	6.52	3,895.84	147.43	16.85	148.39	0.00	0.00	0.00
4,000.00	3.25	6.52	3,995.68	153.06	17.49	154.06	0.00	0.00	0.00
4,100.00	3.25	6.52	4,095.51	158.69	18.14	159.72	0.00	0.00	0.00
4,200.00	3.25	6.52	4,195.35	164.32	18.78	165.39	0.00	0.00	0.00



Scientific Drilling, Intl

Planning Report



Database: Grand Junction District
 Company: Hilcorp Energy Corp.
 Project: Rio Arriba, NM NAD27
 Site: San Juan 29-6 Pad
 Well: San Juan 29-6 Unit Com 601 1H
 Wellbore: Pilot
 Design: Plan #1

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
 TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
 MD Reference: GL 6782' & RKB 20' @ 6802.00usft
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,300.00	3.25	6.52	4,295.19	169.95	19.42	171.05	0.00	0.00	0.00
4,400.00	3.25	6.52	4,395.03	175.58	20.07	176.72	0.00	0.00	0.00
4,500.00	3.25	6.52	4,494.87	181.21	20.71	182.39	0.00	0.00	0.00
4,600.00	3.25	6.52	4,594.71	186.84	21.35	188.05	0.00	0.00	0.00
4,700.00	3.25	6.52	4,694.55	192.47	22.00	193.72	0.00	0.00	0.00
4,800.00	3.25	6.52	4,794.39	198.10	22.64	199.39	0.00	0.00	0.00
4,843.35	3.25	6.52	4,837.67	200.54	22.92	201.84	0.00	0.00	0.00
4,900.00	2.12	6.52	4,894.26	203.17	23.22	204.49	2.00	-2.00	0.00
5,000.00	0.12	6.52	4,994.23	205.10	23.44	206.44	2.00	-2.00	0.00
5,005.77	0.00	0.00	5,000.00	205.11	23.44	206.45	2.00	-2.00	0.00
5,100.00	0.00	0.00	5,094.23	205.11	23.44	206.45	0.00	0.00	0.00
5,200.00	0.00	0.00	5,194.23	205.11	23.44	206.45	0.00	0.00	0.00
5,300.00	0.00	0.00	5,294.23	205.11	23.44	206.45	0.00	0.00	0.00
5,337.77	0.00	0.00	5,332.00	205.11	23.44	206.45	0.00	0.00	0.00
Cliffhouse									
5,400.00	0.00	0.00	5,394.23	205.11	23.44	206.45	0.00	0.00	0.00
5,500.00	0.00	0.00	5,494.23	205.11	23.44	206.45	0.00	0.00	0.00
5,536.77	0.00	0.00	5,531.00	205.11	23.44	206.45	0.00	0.00	0.00
Menefee									
5,600.00	0.00	0.00	5,594.23	205.11	23.44	206.45	0.00	0.00	0.00
5,700.00	0.00	0.00	5,694.23	205.11	23.44	206.45	0.00	0.00	0.00
5,800.00	0.00	0.00	5,794.23	205.11	23.44	206.45	0.00	0.00	0.00
5,872.77	0.00	0.00	5,867.00	205.11	23.44	206.45	0.00	0.00	0.00
Point Lookout									
5,900.00	0.00	0.00	5,894.23	205.11	23.44	206.45	0.00	0.00	0.00
5,900.77	0.00	0.00	5,895.00	205.11	23.44	206.45	0.00	0.00	0.00
Base Menefee									
6,000.00	0.00	0.00	5,994.23	205.11	23.44	206.45	0.00	0.00	0.00
6,100.00	0.00	0.00	6,094.23	205.11	23.44	206.45	0.00	0.00	0.00
6,200.00	0.00	0.00	6,194.23	205.11	23.44	206.45	0.00	0.00	0.00
6,278.77	0.00	0.00	6,273.00	205.11	23.44	206.45	0.00	0.00	0.00
Mancos									
6,300.00	0.00	0.00	6,294.23	205.11	23.44	206.45	0.00	0.00	0.00
6,400.00	0.00	0.00	6,394.23	205.11	23.44	206.45	0.00	0.00	0.00
6,500.00	0.00	0.00	6,494.23	205.11	23.44	206.45	0.00	0.00	0.00
6,600.00	0.00	0.00	6,594.23	205.11	23.44	206.45	0.00	0.00	0.00
6,680.77	0.00	0.00	6,675.00	205.11	23.44	206.45	0.00	0.00	0.00
Mancos A									
6,700.00	0.00	0.00	6,694.23	205.11	23.44	206.45	0.00	0.00	0.00
6,800.00	0.00	0.00	6,794.23	205.11	23.44	206.45	0.00	0.00	0.00
6,900.00	0.00	0.00	6,894.23	205.11	23.44	206.45	0.00	0.00	0.00
6,963.77	0.00	0.00	6,958.00	205.11	23.44	206.45	0.00	0.00	0.00
Mancos B									
7,000.00	0.00	0.00	6,994.23	205.11	23.44	206.45	0.00	0.00	0.00
7,100.00	0.00	0.00	7,094.23	205.11	23.44	206.45	0.00	0.00	0.00
7,149.77	0.00	0.00	7,144.00	205.11	23.44	206.45	0.00	0.00	0.00
Mancos C									
7,200.00	0.00	0.00	7,194.23	205.11	23.44	206.45	0.00	0.00	0.00
7,239.77	0.00	0.00	7,234.00	205.11	23.44	206.45	0.00	0.00	0.00
Mancos D									
7,300.00	0.00	0.00	7,294.23	205.11	23.44	206.45	0.00	0.00	0.00
7,400.00	0.00	0.00	7,394.23	205.11	23.44	206.45	0.00	0.00	0.00
7,500.00	0.00	0.00	7,494.23	205.11	23.44	206.45	0.00	0.00	0.00



Database: Grand Junction District
Company: Hilcorp Energy Corp.
Project: Rio Arriba, NM NAD27
Site: San Juan 29-6 Pad
Well: San Juan 29-6 Unit Com 601 1H
Wellbore: Pilot
Design: Plan #1

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
MD Reference: GL 6782' & RKB 20' @ 6802.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,600.00	0.00	0.00	7,594.23	205.11	23.44	206.45	0.00	0.00	0.00
7,700.00	0.00	0.00	7,694.23	205.11	23.44	206.45	0.00	0.00	0.00
7,800.00	0.00	0.00	7,794.23	205.11	23.44	206.45	0.00	0.00	0.00
7,900.00	0.00	0.00	7,894.23	205.11	23.44	206.45	0.00	0.00	0.00
8,000.00	0.00	0.00	7,994.23	205.11	23.44	206.45	0.00	0.00	0.00

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,726.28	2,724.00	Ojo Alamo		0.00	0.00
2,891.54	2,889.00	Kirtland		0.00	0.00
3,427.40	3,424.00	Fruitland		0.00	0.00
3,672.80	3,669.00	Pictured Cliffs		0.00	0.00
3,752.93	3,749.00	Lewis Shale		0.00	0.00
5,337.77	5,332.00	Cliffhouse		0.00	0.00
5,536.77	5,531.00	Menefee		0.00	0.00
5,872.77	5,867.00	Point Lookout		0.00	0.00
5,900.77	5,895.00	Base Menefee		0.00	0.00
6,278.77	6,273.00	Mancos		0.00	0.00
6,680.77	6,675.00	Mancos A		0.00	0.00
6,963.77	6,958.00	Mancos B		0.00	0.00
7,149.77	7,144.00	Mancos C		0.00	0.00
7,239.77	7,234.00	Mancos D		0.00	0.00



Company: Hilcorp Energy Corp.
Project: Rio Arriba, NM NAD27
Site: San Juan 29-6 Pad
Well: San Juan 29-6 Unit Com 601 1H
Wellbore: OH
Design: Plan #3

PROJECT DETAILS: Rio Arriba, NM NAD27

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico West 3003
System Datum: Mean Sea Level
Local North: True



Azimuths to True North
Magnetic North: 8.98°

Magnetic Field
Strength: 49920.2snT
Dip Angle: 63.33°
Date: 2/14/2018
Model: HDGM

WELL DETAILS: San Juan 29-6 Unit Com 601 1H

GL 6782' & RKB 20' @ 6802.00usft
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 2088921.13 599231.13 36.7403560 -107.4946670

Plan: Plan #3 (San Juan 29-6 Unit Com 601 1H/OH)

Created By: Janie Collins Date: 10:35, June 06 2018

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
SJ 601 1H LP	7314.00	205.65	484.20	2089128.49	599714.60
SJ 601 1H BHL	7329.00	177.33	7954.84	2089126.58	607185.29

SECTION DETAILS

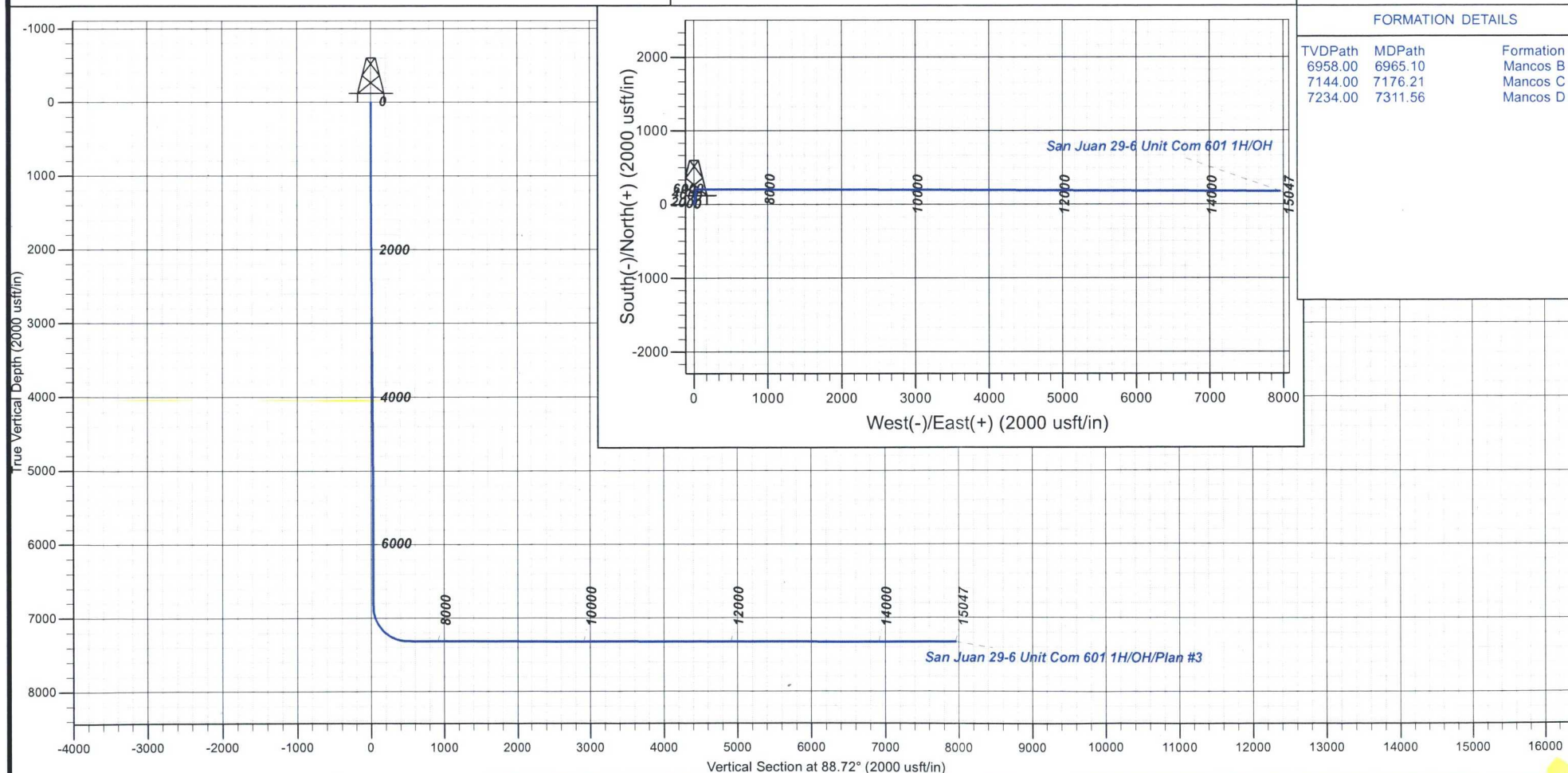
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
6843.00	0.00	0.00	6837.23	205.11	23.44	0.00	0.00	28.01	
7571.58	87.51	89.93	7313.81	205.64	479.74	12.01	89.93	484.21	
7576.04	87.51	89.93	7314.00	205.65	484.20	0.00	0.00	488.66	SJ 601 1H LP
7696.58	89.90	90.22	7316.72	205.49	604.70	2.00	6.83	609.13	
15046.79	89.90	90.22	7329.00	177.33	7954.84	0.00	0.00	7956.82	SJ 601 1H BHL

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
6958.00	6965.10	Mancos B
7144.00	7176.21	Mancos C
7234.00	7311.56	Mancos D





Hilcorp Energy Corp.

Rio Arriba, NM NAD27

San Juan 29-6 Pad

San Juan 29-6 Unit Com 601 1H

OH

Plan: Plan #3

Standard Planning Report

06 June, 2018



www.scientificdrilling.com



Hilcorp

Rio Arriba, NM

San Juan 29-6

San Juan 29-6

OH

Plan: Plan #3

Standard

06 June, 2018



www.scientificdrilling.com



Scientific Drilling, Intl
Planning Report



Database: Grand Junction District
Company: Hilcorp Energy Corp.
Project: Rio Arriba, NM NAD27
Site: San Juan 29-6 Pad
Well: San Juan 29-6 Unit Com 601 1H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
MD Reference: GL 6782' & RKB 20' @ 6802.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

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

Site	San Juan 29-6 Pad		
Site Position:		Northing:	2,088,921.13 usft
From:	Lat/Long	Easting:	599,231.13 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	36.7403560
		Longitude:	-107.4946670
		Grid Convergence:	0.20 °

Well	San Juan 29-6 Unit Com 601 1H		
Well Position	+N/-S	0.00 usft	Northing: 2,088,921.13 usft
	+E/-W	0.00 usft	Easting: 599,231.13 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36.7403560
		Longitude:	-107.4946670
		Ground Level:	6,782.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	2/14/2018	8.98
			Dip Angle (°)
			63.33
			Field Strength (nT)
			49,920

Design	Plan #3		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 6,843.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			88.72

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
6,843.00	0.00	0.00	6,837.23	205.11	23.44	0.00	0.00	0.00	0.00	
7,571.58	87.51	89.93	7,313.81	205.64	479.74	12.01	12.01	12.34	89.93	
7,576.04	87.51	89.93	7,314.00	205.65	484.20	0.00	0.00	0.00	0.00	SJ 601 1H LP
7,696.58	89.90	90.22	7,316.72	205.49	604.70	2.00	1.99	0.24	6.83	
15,046.79	89.90	90.22	7,329.00	177.33	7,954.84	0.00	0.00	0.00	0.00	SJ 601 1H BHL



Scientific Drilling, Intl Planning Report



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Company: Hilcorp Energy Corp.
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Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
MD Reference: GL 6782' & RKB 20' @ 6802.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,843.00	0.00	0.00	6,837.23	205.11	23.44	28.01	0.00	0.00	0.00
6,900.00	6.85	89.93	6,894.10	205.11	26.84	31.41	12.01	12.01	0.00
6,965.10	14.67	89.93	6,958.00	205.13	38.98	43.54	12.01	12.01	0.00
Mancos B									
7,000.00	18.86	89.93	6,991.41	205.14	49.04	53.60	12.01	12.01	0.00
7,100.00	30.87	89.93	7,081.98	205.19	91.01	95.56	12.01	12.01	0.00
7,176.21	40.02	89.93	7,144.00	205.24	135.16	139.70	12.01	12.01	0.00
Mancos C									
7,200.00	42.88	89.93	7,161.83	205.26	150.91	155.44	12.01	12.01	0.00
7,300.00	54.89	89.93	7,227.47	205.35	226.11	230.63	12.01	12.01	0.00
7,311.56	56.28	89.93	7,234.00	205.36	235.65	240.17	12.01	12.01	0.00
Mancos D									
7,400.00	66.90	89.93	7,276.02	205.45	313.32	317.82	12.01	12.01	0.00
7,500.00	78.91	89.93	7,305.35	205.56	408.73	413.21	12.01	12.01	0.00
7,571.58	87.51	89.93	7,313.81	205.64	479.74	484.21	12.01	12.01	0.00
7,576.04	87.51	89.93	7,314.00	205.65	484.20	488.66	0.00	0.00	0.00
SJ 601 1H LP									
7,600.00	87.99	89.99	7,314.94	205.67	508.14	512.60	2.00	1.99	0.24
7,696.58	89.90	90.22	7,316.72	205.49	604.70	609.13	2.00	1.99	0.24
7,700.00	89.90	90.22	7,316.72	205.48	608.12	612.55	0.00	0.00	0.00
7,800.00	89.90	90.22	7,316.89	205.09	708.12	712.51	0.00	0.00	0.00
7,900.00	89.90	90.22	7,317.06	204.71	808.12	812.48	0.00	0.00	0.00
8,000.00	89.90	90.22	7,317.23	204.33	908.12	912.44	0.00	0.00	0.00
8,100.00	89.90	90.22	7,317.39	203.94	1,008.12	1,012.41	0.00	0.00	0.00
8,200.00	89.90	90.22	7,317.56	203.56	1,108.11	1,112.38	0.00	0.00	0.00
8,300.00	89.90	90.22	7,317.73	203.18	1,208.11	1,212.34	0.00	0.00	0.00
8,400.00	89.90	90.22	7,317.89	202.79	1,308.11	1,312.31	0.00	0.00	0.00
8,500.00	89.90	90.22	7,318.06	202.41	1,408.11	1,412.27	0.00	0.00	0.00
8,600.00	89.90	90.22	7,318.23	202.03	1,508.11	1,512.24	0.00	0.00	0.00
8,700.00	89.90	90.22	7,318.40	201.64	1,608.11	1,612.21	0.00	0.00	0.00
8,800.00	89.90	90.22	7,318.56	201.26	1,708.11	1,712.17	0.00	0.00	0.00
8,900.00	89.90	90.22	7,318.73	200.88	1,808.11	1,812.14	0.00	0.00	0.00
9,000.00	89.90	90.22	7,318.90	200.50	1,908.11	1,912.10	0.00	0.00	0.00
9,100.00	89.90	90.22	7,319.06	200.11	2,008.11	2,012.07	0.00	0.00	0.00
9,200.00	89.90	90.22	7,319.23	199.73	2,108.11	2,112.03	0.00	0.00	0.00
9,300.00	89.90	90.22	7,319.40	199.35	2,208.11	2,212.00	0.00	0.00	0.00
9,400.00	89.90	90.22	7,319.57	198.96	2,308.10	2,311.97	0.00	0.00	0.00
9,500.00	89.90	90.22	7,319.73	198.58	2,408.10	2,411.93	0.00	0.00	0.00
9,600.00	89.90	90.22	7,319.90	198.20	2,508.10	2,511.90	0.00	0.00	0.00
9,700.00	89.90	90.22	7,320.07	197.81	2,608.10	2,611.86	0.00	0.00	0.00
9,800.00	89.90	90.22	7,320.23	197.43	2,708.10	2,711.83	0.00	0.00	0.00
9,900.00	89.90	90.22	7,320.40	197.05	2,808.10	2,811.79	0.00	0.00	0.00
10,000.00	89.90	90.22	7,320.57	196.66	2,908.10	2,911.76	0.00	0.00	0.00
10,100.00	89.90	90.22	7,320.73	196.28	3,008.10	3,011.73	0.00	0.00	0.00
10,200.00	89.90	90.22	7,320.90	195.90	3,108.10	3,111.69	0.00	0.00	0.00
10,300.00	89.90	90.22	7,321.07	195.51	3,208.10	3,211.66	0.00	0.00	0.00
10,400.00	89.90	90.22	7,321.24	195.13	3,308.10	3,311.62	0.00	0.00	0.00
10,500.00	89.90	90.22	7,321.40	194.75	3,408.09	3,411.59	0.00	0.00	0.00
10,600.00	89.90	90.22	7,321.57	194.36	3,508.09	3,511.55	0.00	0.00	0.00
10,700.00	89.90	90.22	7,321.74	193.98	3,608.09	3,611.52	0.00	0.00	0.00
10,800.00	89.90	90.22	7,321.90	193.60	3,708.09	3,711.49	0.00	0.00	0.00
10,900.00	89.90	90.22	7,322.07	193.21	3,808.09	3,811.45	0.00	0.00	0.00
11,000.00	89.90	90.22	7,322.24	192.83	3,908.09	3,911.42	0.00	0.00	0.00
11,100.00	89.90	90.22	7,322.41	192.45	4,008.09	4,011.38	0.00	0.00	0.00



Scientific Drilling, Intl
Planning Report



Database: Grand Junction District
Company: Hilcorp Energy Corp.
Project: Rio Arriba, NM NAD27
Site: San Juan 29-6 Pad
Well: San Juan 29-6 Unit Com 601 1H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
MD Reference: GL 6782' & RKB 20' @ 6802.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,200.00	89.90	90.22	7,322.57	192.07	4,108.09	4,111.35	0.00	0.00	0.00
11,300.00	89.90	90.22	7,322.74	191.68	4,208.09	4,211.31	0.00	0.00	0.00
11,400.00	89.90	90.22	7,322.91	191.30	4,308.09	4,311.28	0.00	0.00	0.00
11,500.00	89.90	90.22	7,323.07	190.92	4,408.09	4,411.25	0.00	0.00	0.00
11,600.00	89.90	90.22	7,323.24	190.53	4,508.09	4,511.21	0.00	0.00	0.00
11,700.00	89.90	90.22	7,323.41	190.15	4,608.08	4,611.18	0.00	0.00	0.00
11,800.00	89.90	90.22	7,323.58	189.77	4,708.08	4,711.14	0.00	0.00	0.00
11,900.00	89.90	90.22	7,323.74	189.38	4,808.08	4,811.11	0.00	0.00	0.00
12,000.00	89.90	90.22	7,323.91	189.00	4,908.08	4,911.07	0.00	0.00	0.00
12,100.00	89.90	90.22	7,324.08	188.62	5,008.08	5,011.04	0.00	0.00	0.00
12,200.00	89.90	90.22	7,324.24	188.23	5,108.08	5,111.01	0.00	0.00	0.00
12,300.00	89.90	90.22	7,324.41	187.85	5,208.08	5,210.97	0.00	0.00	0.00
12,400.00	89.90	90.22	7,324.58	187.47	5,308.08	5,310.94	0.00	0.00	0.00
12,500.00	89.90	90.22	7,324.74	187.08	5,408.08	5,410.90	0.00	0.00	0.00
12,600.00	89.90	90.22	7,324.91	186.70	5,508.08	5,510.87	0.00	0.00	0.00
12,700.00	89.90	90.22	7,325.08	186.32	5,608.08	5,610.84	0.00	0.00	0.00
12,800.00	89.90	90.22	7,325.25	185.93	5,708.07	5,710.80	0.00	0.00	0.00
12,900.00	89.90	90.22	7,325.41	185.55	5,808.07	5,810.77	0.00	0.00	0.00
13,000.00	89.90	90.22	7,325.58	185.17	5,908.07	5,910.73	0.00	0.00	0.00
13,100.00	89.90	90.22	7,325.75	184.78	6,008.07	6,010.70	0.00	0.00	0.00
13,200.00	89.90	90.22	7,325.91	184.40	6,108.07	6,110.66	0.00	0.00	0.00
13,300.00	89.90	90.22	7,326.08	184.02	6,208.07	6,210.63	0.00	0.00	0.00
13,400.00	89.90	90.22	7,326.25	183.64	6,308.07	6,310.60	0.00	0.00	0.00
13,500.00	89.90	90.22	7,326.42	183.25	6,408.07	6,410.56	0.00	0.00	0.00
13,600.00	89.90	90.22	7,326.58	182.87	6,508.07	6,510.53	0.00	0.00	0.00
13,700.00	89.90	90.22	7,326.75	182.49	6,608.07	6,610.49	0.00	0.00	0.00
13,800.00	89.90	90.22	7,326.92	182.10	6,708.07	6,710.46	0.00	0.00	0.00
13,900.00	89.90	90.22	7,327.08	181.72	6,808.07	6,810.42	0.00	0.00	0.00
14,000.00	89.90	90.22	7,327.25	181.34	6,908.06	6,910.39	0.00	0.00	0.00
14,100.00	89.90	90.22	7,327.42	180.95	7,008.06	7,010.36	0.00	0.00	0.00
14,200.00	89.90	90.22	7,327.59	180.57	7,108.06	7,110.32	0.00	0.00	0.00
14,300.00	89.90	90.22	7,327.75	180.19	7,208.06	7,210.29	0.00	0.00	0.00
14,400.00	89.90	90.22	7,327.92	179.80	7,308.06	7,310.25	0.00	0.00	0.00
14,500.00	89.90	90.22	7,328.09	179.42	7,408.06	7,410.22	0.00	0.00	0.00
14,600.00	89.90	90.22	7,328.25	179.04	7,508.06	7,510.18	0.00	0.00	0.00
14,700.00	89.90	90.22	7,328.42	178.65	7,608.06	7,610.15	0.00	0.00	0.00
14,800.00	89.90	90.22	7,328.59	178.27	7,708.06	7,710.12	0.00	0.00	0.00
14,900.00	89.90	90.22	7,328.75	177.89	7,808.06	7,810.08	0.00	0.00	0.00
15,000.00	89.90	90.22	7,328.92	177.50	7,908.06	7,910.05	0.00	0.00	0.00
15,046.79	89.90	90.22	7,329.00	177.33	7,954.84	7,956.82	0.00	0.00	0.00

SJ 601 1H BHL



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Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well San Juan 29-6 Unit Com 601 1H
TVD Reference: GL 6782' & RKB 20' @ 6802.00usft
MD Reference: GL 6782' & RKB 20' @ 6802.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SJ 601 1H LP - plan hits target center - Point	0.00	0.00	7,314.00	205.65	484.20	2,089,128.49	599,714.60	36.7409209	-107.4930145
SJ 601 1H BHL - plan hits target center - Point	0.00	0.00	7,329.00	177.33	7,954.84	2,089,126.58	607,185.30	36.7408400	-107.4675180

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,726.28	2,724.00	Ojo Alamo		0.00	0.00
2,891.54	2,889.00	Kirtland		0.00	0.00
3,427.40	3,424.00	Fruitland		0.00	0.00
3,672.80	3,669.00	Pictured Cliffs		0.00	0.00
3,752.93	3,749.00	Lewis Shale		0.00	0.00
5,337.77	5,332.00	Cliffhouse		0.00	0.00
5,536.77	5,531.00	Menefee		0.00	0.00
5,872.77	5,867.00	Point Lookout		0.00	0.00
5,900.77	5,895.00	Base Menefee		0.00	0.00
6,278.77	6,273.00	Mancos		0.00	0.00
6,680.77	6,675.00	Mancos A		0.00	0.00
6,965.10	6,958.00	Mancos B		0.00	0.00
7,176.21	7,144.00	Mancos C		0.00	0.00
7,311.56	7,234.00	Mancos D		0.00	0.00

Project specific design features determined during the May 16, 2018 onsite visit in regards to the temporary surface pipeline:

- Where the proposed surface waterline crosses existing roads, it will be cased with a larger diameter steel pipe. Diameter of casing pipe may vary depending on inside diameter needed to accommodate the layflat hose collars. It is assumed a minimum of 14-inch pipe or maximum of 18-inch pipe will be used as casing. The casing pipe will be laid at grade of existing road and padded/covered with road base or other like material to allow vehicle passage. Cover material will be graded out to give a tapered ingress and egress over the crossing as opposed to an abrupt bump. With the use of casing pipe, the layflat hose may be installed or removed (in the event repairs are needed) without removing the casing pipe. Please see the road crossing drawing in Appendix H.
- All other design features concerning the surface waterline such as secondary containments around diesel fueled pumps and check valves are shown in Appendix G. Any design features per request by the surface owner or surface management agency will be outlined in the COAs attached to the approved APD, ROW Grant stipulations, license agreement stipulations, ROE stipulations, or SUA.

6) CONSTRUCTION MATERIALS

The construction phase of the project would commence upon receipt of the approved APD, license agreements, ROE, and ROW grants. The BLM-FFO would be notified (505-564-7600) at least 48 hours prior to the start of construction activities associated with the project. All project activities would be confined to permitted areas only.

All surface infrastructure (well pad, access road, OHV trail, booster stations, staging areas, and VFD pad) would be constructed utilizing native borrow within the permitted area to create a balanced working surface. If the need for surfacing material arises, it will be obtained from a permitted location approved by the surface managing agency or surface owner. Surfacing material on the proposed well pad and well pad access road will be obtained from Robert A. & Patricia L. Smith Trust lands per the stipulations outlined in the SUA.

Construction and maintenance activities would cease if soil or road surfaces become saturated to the extent that construction equipment is unable to stay within the project area and/or when activities cause irreparable harm to roads, soils, or streams.

7) METHODS FOR HANDLING WASTE



A. Cuttings

- 1 Drilling operations would utilize a closed-loop system. Drilling of the horizontal laterals would be accomplished with oil-based mud. All cuttings would be placed in roll-off bins and hauled to a commercial disposal facility or land farm. Hilcorp would follow Onshore Oil and Gas Order No. 1 regarding the placement, operation, and removal of closed-loop systems. No blow pit would be used.
- 2 Closed-loop tanks would be adequately sized for containment of all fluids.

B. Drilling Fluids

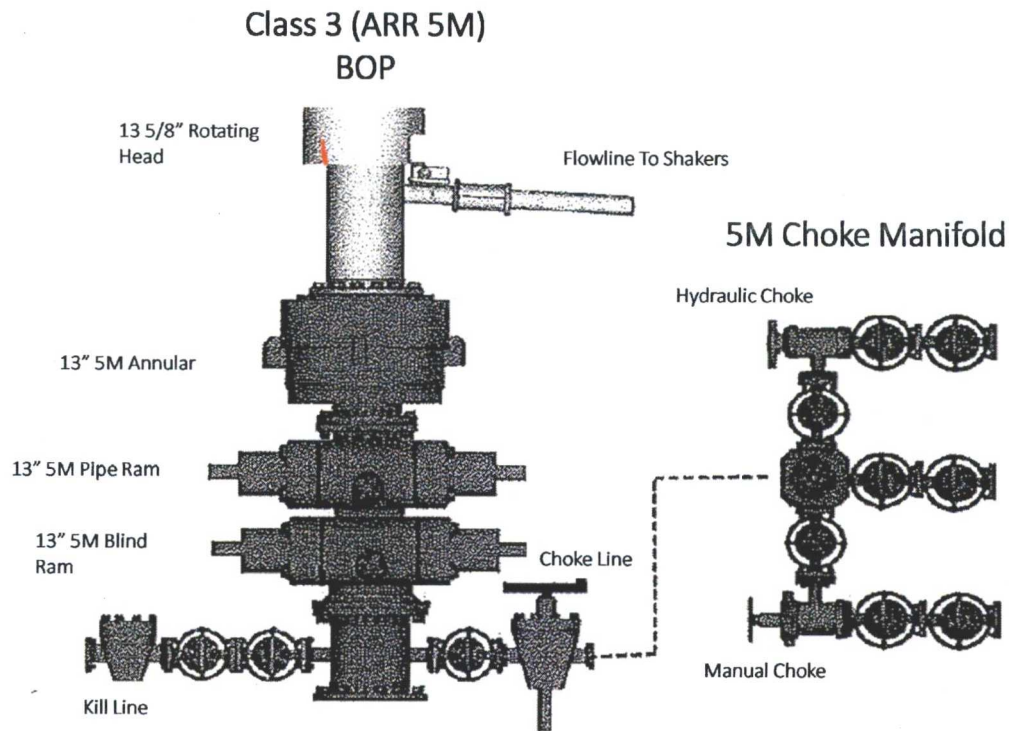
- 1 Drilling fluids would be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids would be recycled and transferred to other permitted closed-loop systems or disposed of at one of the locations specified below in part G.

C. Spills

- 1 Any spills of non-freshwater fluids would be immediately cleaned up and removed to an approved disposal site.

BOPE & Choke Manifold Schematic

13-5/8" BOPE



Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Hilcorp Energy Company San Juan 29-6 Unit Com 601 #1H
2579' FNL & 18' FWL, Section 8, T29N, R6W, N.M.P.M., Rio Arriba County, NM

Latitude: 36.740362°N Longitude: 107.495272°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Easterly on US Hwy 64 for 37.8 miles to State Highway #527;

Go Left (North-westerly) on State Hwy #527 for 0.6 miles to fork in roadway;

Go Left (Westerly) exiting State Hwy #527 for 2.5 miles to fork in roadway;

Go Left (Westerly) which is straight for 0.8 miles to fork in roadway;

Go Right (North-westerly) for 3.0 miles to fork in roadway;

Go Right (North-westerly) for 1.0 miles to fork in roadway;

Go Left (North-westerly) which is straight for 0.3 miles to begin proposed access on left-hand side of roadway which continues for 25.9' to staked Hilcorp San Juan 29-6 Unit Com 601 #1H location.