

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Adrienne Sandoval, 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: 6/15/2019

Well information;

Operator QUR, Well Name and Number North Alamo Unit 529H

API# 30-043-21334⁵, Section 31, Township 23N/S, Range 7 E/W

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

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ If cement doesn't circulate on any casing string or stage tool a CBL will be required. Contact the regulatory agencies prior to proceeding.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
 - ☐ Hold C-104 for: NSL, NSP, DHC, 5.9 Compliance
 - ☐ 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.

Bob Bell
NMOCD Approved by Signature

1/28/20
Date

- File Sundry to BLM for API # Change
* See change of plans
next document
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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM006681
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☒ Multiple Zone		7. If Unit or CA Agreement, Name and No. /1/NORTH ALAMITO UNIT / NMNM13522
2. Name of Operator DJR OPERATING LLC		8. Lease Name and Well No. NORTH ALAMITO UNIT 529H
3a. Address 1600 Broadway #1960 Denver CO 80202	3b. Phone No. (include area code) (303)595-7430	9. API Well No. 30-048-21335
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NWSE / 2244 FSL / 2504 FEL / LAT 36.18217 / LONG -107.615006 At proposed prod. zone SWNW / 1542 FNL / 330 FWL / LAT 36.200816 / LONG -107.640946		10. Field and Pool, or Exploratory ALAMITO MANCOS N (OIL)
11. Sec., T. R. M. or Blk. and Survey or Area SEC 31 / T23N / R7W / NMP		
14. Distance in miles and direction from nearest town or post office* 47 miles		12. County or Parish SANDOVAL
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 329 feet	16. No of acres in lease 642.56	17. Spacing Unit dedicated to this well 601.24
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet	19. Proposed Depth 5114 feet / 15705 feet	20. BLM/BIA Bond No. in file FED: NMB001464
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6979 feet	22. Approximate date work will start* 03/10/2020	23. Estimated duration 10 days
24. Attachments		

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Shaw-Marie N. Ford / Ph: (505)632-3476	Date 06/05/2019
Title Regulatory Specialist		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Dave Mankiewicz / Ph: (505)564-7761	Date 12/23/2019
Title AFM-Minerals		
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)

APPROVED WITH CONDITIONS
Approval Date: 12/23/2019

NMOC

DEC 24 2019

DISTRICT III

*(Instructions on page 2)

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 86240
Phone: (575) 393-6161 Fu: (575) 393-0720

DISTRICT II
611 S. Flint St., Artesia, N.M. 86210
Phone: (575) 748-1263 Fu: (575) 748-9720

DISTRICT III
1000 Rio Brazol Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fu: (505) 334-6170

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

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 Dr.
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30.043-21335	¹ Pool Code 98174	¹ Pool Name NORTH ALAMITO UNIT MANCOS OIL POOL
² Property Code 325267	² Property Name NORTH ALAMITO UNIT	² Well Number 529H
⁷ GRID No 371838	⁷ operator Name DJR OPERATING, LLC	⁷ Elevation 6979'

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
J	31	23N	7W		2244'	SOUTH	2504'	EAST	SANDOVAL

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	25	23N	8W		1542'	NORTH	330'	WEST	SAN JUAN

¹¹ Dedicated Acres PENETRATED SPACING UNIT
SEC 31 NW/SE, SW/NE, NE/SW, SE/NW, LOT 1 & LOT
2 (241.24 AC); SEC 36 NE/NE (40 AC) SEC 25
SE/SE SW/SE, NW/SE, SE/SW, NE/SW, NW/SW, SE/NW
& SW/NW (320 AC) = 601.24 ACRES TOTAL

¹¹ Joint or Infill

¹¹ Consolidation Code

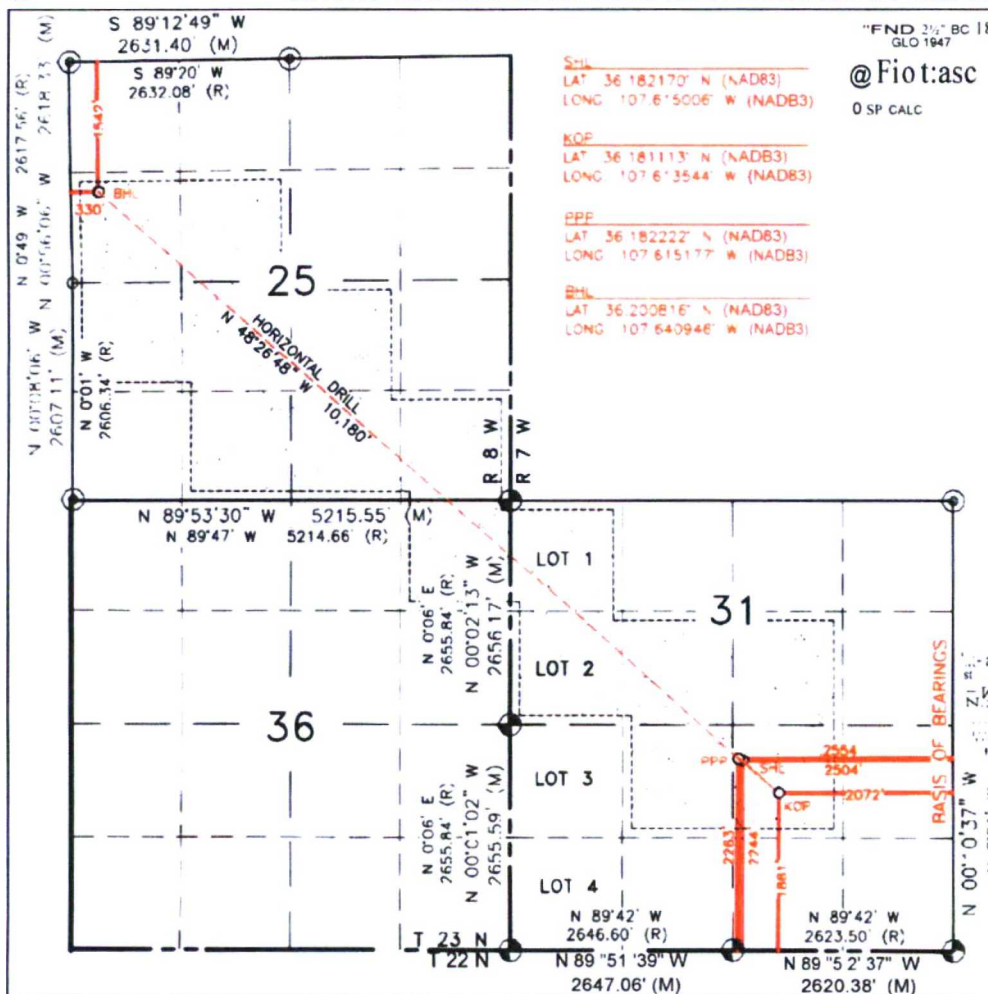
¹¹ order No

R-14081, R-14081A

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

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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.

Steven Merrell 5/29/19
Signature Date

Steven Merrell

Printed Name

Smerrell@djrlc.com

E-mail Address

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

14 MARCH 15, 2019

Date of Survey

Signature and Seal of Professional Surveyor:



Certificate Number

11393

DISTRICT I

1625 N. French Dr., Hobbs, N.M. 88240
Phone (575) 393-6161 Fu (575) 393-0720

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DISTRICT IV

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Phone (505) 476-3460 Fu (505) 476-3462

State of New Mexico
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Form C-102
Revised August 1, 2011

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Santa Fe, NM 87505

☐ AMENDED REPORT

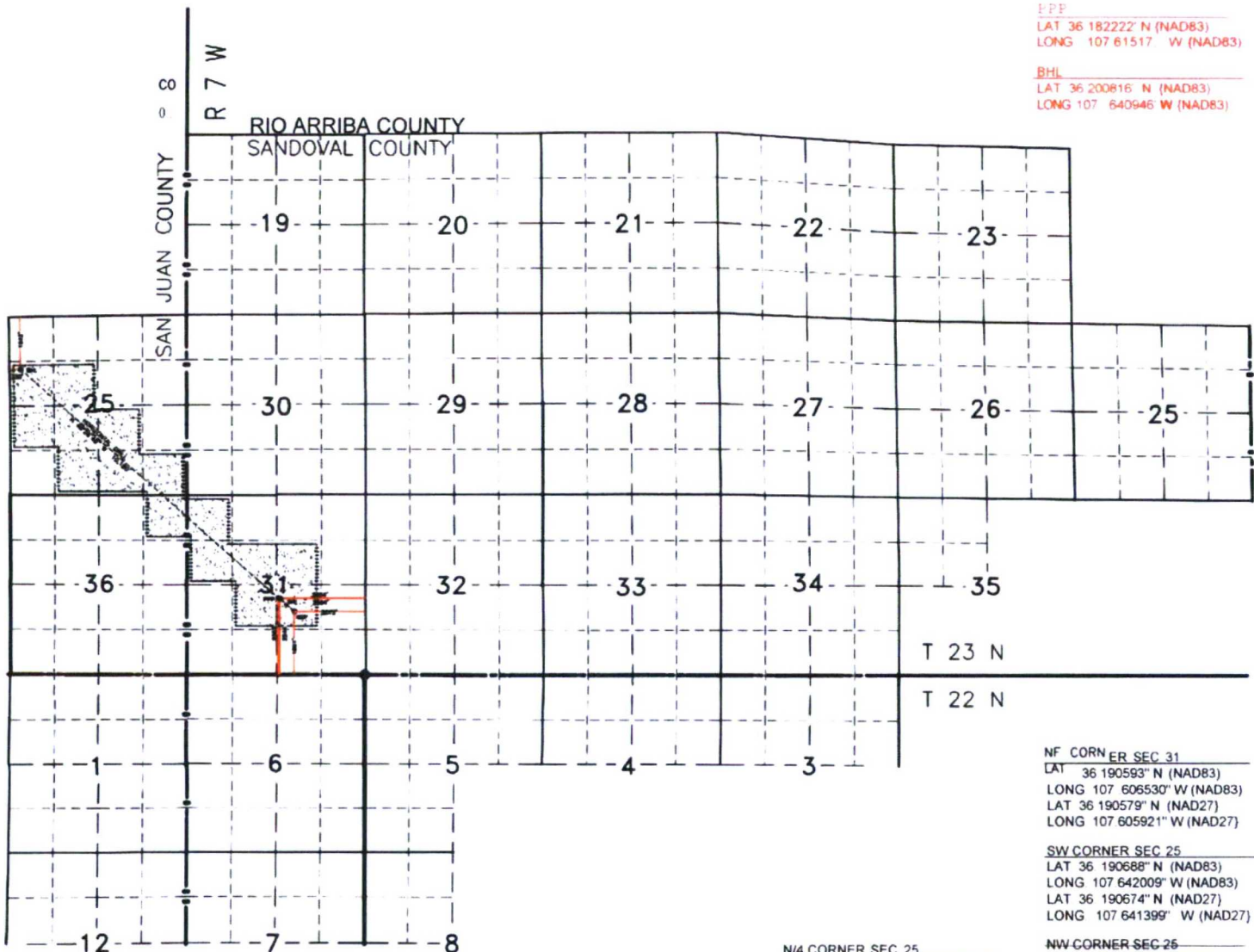
DJR OPERATING, LLC
NORTH ALAMITO UNIT #529H

SHL
LAT 36 182170" N (NAD83)
LONG 107 615006" W (NAD83)

KOP
LAT 36 181113" N (NAD83)
LONG 107 613544" W (NAD83)

EPP
LAT 36 182222" N (NAD83)
LONG 107 61517" W (NAD83)

BHL
LAT 36 200816" N (NAD83)
LONG 107 640946" W (NAD83)



NF CORNER SEC 31
LAT 36 190593" N (NAD83)
LONG 107 606530" W (NAD83)
LAT 36 190579" N (NAD27)
LONG 107 605921" W (NAD27)

SW CORNER SEC 25
LAT 36 190688" N (NAD83)
LONG 107 642009" W (NAD83)
LAT 36 190674" N (NAD27)
LONG 107 641399" W (NAD27)

N/4 CORNER SEC 25
LAT 36 205127" N (NAD83)
LONG 107 633221" W (NAD83)
LAT 36 205113" N (NAD27)
LONG 107 632612" W (NAD27)

W/4 CORNER SEC 25
LAT 36 197850" N (NAD83)
LONG 107 642012" W (NAD83)
LAT 36 197836" N (NAD27)
LONG 107 641402" W (NAD27)

NW CORNER SEC 31
LAT 36 190632" N (NAD83)
LONG 107 624334" W (NAD83)
LAT 36 190618" N (NAD27)
LONG 107 623725" W (NAD27)

NW CORNER SEC 25
LAT 36 161443" N (NAD83)
LONG 107 606813" W (NAD83)
LAT 36 161428" N (NAD27)
LONG 107 606205" W (NAD27)

S/4 CORNER SEC 31
LAT 36 176006" N (NAD83)
LONG 107 615395" W (NAD83)
LAT 36 175 992" N (NAD27)
LONG 107 614786" W (NAD27)

SE CORNER SEC 31
LAT 36 175974" N (NAD83)
LONG 107 606516" W (NAD83)
LAT 36 175960" N (NAD27)
LONG 107 605908" W (NAD27)

PENETRATED SPACING UNIT;

SEC 31: NW/SE, SW/NE, NE/SW, SE/NW, LOT 1 & LOT 2 (241.24 AC.);
SEC 36: NE/NE (40 AC.) SEC 25: SE/SE SW/SE, NW/SE, SE/SW,
NE/SW, NW/SW, SE/NW & SW/NW (320 AC.) = 601.24 ACRES TOTAL

TOTAL 14,262.78 ACRES: T23N R7W SEC. 19-23, 25, 26-34 (ALL); 35 (NW/4);
T22N R7W SEC. 3 & 4 (N/2); 5 (N/2, SW/4); 6 (ALL); 7 (N/2); 8 (NW/4); T23N
RBW SEC. 25, 36 (ALL); T22N RBW SEC. 1 (ALL); SEC. 12 (N/2) - UNDIVIDED
UNIT

DRILLING PLAN

North Alamito Unit 529H

Sandoval County, New Mexico

Surface Location

2504-ft FEL & 2244-ft FSL
 Sec 31 T23N R7W
 Graded Elevation 6979' MSL
 RKB Elevation 6993' (14' KB)

SHL Geographical Coordinates (NAD-83)

Latitude 36.1821700° N
 Longitude 107.6150060° W

Kick Off Point for Horizontal Build Curve

4420-ft MD
 4373-ft TVD

Local Coordinates (from SHL)

384-ft South
 432-ft East

Heel Location (Pay zone entry)

2554-ft FEL & 2263-ft FSL
 Sec 31 T23N R7W

Heel Geographical Coordinates (NAD-83)

Latitude 36.182222° N
 Longitude 107.61517670° W

Bottom Hole Location (TD)

330-ft FWL & 1542-ft FNL
 Sec 25 T23N R8W

BHL Geographical Coordinates (NAD-83)

Latitude 36.2008166° N
 Longitude 107.6409466° W

First Take Point (FTP)

5584-ft MD
 Gallup C Sand

FTP Geographical Coordinates (NAD-83)

Latitude 36.1823316° N
 Longitude 107.6153285° W

Last Take Point (LTP)

15645-ft MD
 Gallup C Sand

LTP Geographical Coordinates (NAD-83)

Latitude 36.2007071° N
 Longitude 107.6407948° W

Well objectives

This well is planned as a 10180-ft lateral in the Gallup C sand.

Bottom Hole temperature and pressure

The temperature in the Gallup C horizontal objective is 139°F. Bottom hole pressure in the Gallup C is forecast to be 1985 psi.

Formation Tops (Sd = Sand; Sh = Shale; Siltstone = Slt, Coal = C; W = water; O = oil; G = gas; NP = no penetration)

Name	MD (ft)	TVD (ft)	Lithology	Pore fluid	Expected Pore Pressure (ppg)	Planned Mud Weight (ppg)
Ojo Alamo	877	875	Sd	W	8.3	8.4 – 8.8
Kirtland	929	929	Sh	-	8.3	8.4 – 8.8
Fruitland	1172	1172	C	G	8.3	9.0 - 9.5
Picture Cliffs	1463	1456	Sd	W	8.3	9.0 - 9.5
Lewis	1633	1624	Sh	-		9.0 - 9.5
Chacra	2239	2222	Sd	-	8.3	9.0 - 9.5
Menefee	2970	2943	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	3881	3842	Sd	-	8.3	9.0 - 9.5
Mancos	4064	4022	Sh	-		9.0 - 9.5
Mancos Silt	4402	4356	Slt	O/G	6.6	9.0 - 9.5
Gallup A	4899	4831	Slt	O/G	6.6	9.0 - 9.5
Gallup B	4941	4865	Sd	O/G	6.6	8.8 - 9.0
Gallup C	5083	4967	Sd	O/G	6.6	8.8 - 9.0
Target	5524	5114	Sd	O/G	6.6	8.8 - 9.0

Casing Program

Casing OD	Hole Size	Weight (#/ft)	Grade	Coupling	MD Top	MD Bottom	TVD Top	TVD Bottom	Top of Cement
9-5/8"	12-1/4"	36	K-55	STC	surf	350	surf	350	surface
7"	8-3/4"	26	K-55	LTC	surf	5514	surf	5114	surface
4-1/2"	6-1/8"	11.6	P-110	BTC	5304	15705	5080	5114	5304

Note: all casing will be new

Casing Design Load Cases

	Description	Casing String		
		9-5/8" Surface	7" Intermediate	4-1/2" Production Liner
Collapse	Full internal evacuation ¹	✓	✓	✓
	Cementing	✓	✓	✓
Burst	Pressure test	✓ ²	✓ ²	✓
	Gas kick		✓ ³	
	Fracture at shoe, 1/3 BHP at surface		✓ ⁴	
	Injection down casing			✓ ⁵
Axial	Dynamic load on casing coupling ⁶	✓	✓	✓
Axial	Overpull ⁷	✓	✓	✓

Note #

- 1 Fluid level at shoe, air column to surface, pore pressure outside
- 2 Tested to 80% of minimum internal yield with freshwater inside, pore pressure outside
- 3 50 bbl kick at TD, 0.50 ppg intensity, 4" drill pipe, 9.0 ppg mud, fracture gradient at shoe
- 4 2060 psi BHP, 687 psi surface pressure, 12.5 ppg EMW shoe integrity
- 5 Surface stimulation pressure of 8000 psi on 8.3 ppg fluid column. Stimulation will be down frac string, so load does not apply to 7" intermediate casing.
- 6 Shock load from abrupt pipe deceleration, evaluated against coupling rating
- 7 Overpull values as follows: Surface casing 20,000 lbs, Intermediate & Production 100,000 lbs

Casing Design Factors

		Design Factors			
Casing string	Casing OD	Burst	Collapse	Axial	Triaxial
Surface	9-5/8"	1.25	13.38	8.16	1.56
Intermediate	7"	1.25	1.50	1.68	1.34
Production liner	4-1/2"	1.37	3.68	1.88	1.69

Cement Design

Additives: A=Accelerator; B=Bond Enhancer; De=Defoamer; Di=Dispersant; Ex=Extender; FI=Fluid Loss L=Lost Circulation; R=Retarder; SA=Suspending Agent; THX=Thixotropic Additive; V=Viscosifier

9-5/8" Surface Casing

Name	Lead
Redi-Mix	
Type	I-II
Additives	20% Fly Ash
Planned top	Surface
Density (ppg)	14.50
Yield (cf/sx)	1.61
Mix water (gal/sx)	7.41
Volume (sx)	114
Volume (bbls)	33

<u>7" Intermediate Casing</u>	<u>Lead</u>	<u>Tail</u>
Halliburton Name	HALCEM	VARICEM
Type	Poz/G	Poz/G
Additives	Ex, L, SA	Ex, FI, SA, L, THX
Planned top	Surface	3564-ft
Density (ppg)	12.30	13.50
Yield (cf/sx)	1.95	1.30
Mix water (gal/sx)	10.14	5.64
Volume (sx)	450	389
Volume (bbls)	157	90

<u>4-1/2" Production Liner</u>	<u>Lead</u>
Halliburton Name	EXTENDACEM
Type	Poz/G
Additives	B, De, Di, FI, Re, V
Planned top	5304-ft
Density (ppg)	13.3
Yield (cf/sx)	1.36
Mix water (gal/sx)	5.94
Volume (sx)	1055
Volume (bbls)	255

Wellhead & Pressure Control

The well head will be an 11" 5M multi-bowl system. A 2M BOPE conforming to Onshore Order #2 will be installed on the surface casing. The BOP and accumulator will meet API 16D and 16E respectively.

A PVT mud monitoring system and a trip tank will be rigged up and operational for all hole intervals. An electronic geograph will be employed to monitor and record drilling data (ROP, WOB, SPM, Pressure, RPM and torque).

Mud Program

Surface hole will be drilled with a fresh water, native mud system. In intermediate hole, a low weight 7% KCl LSND drilling fluid will be used, with KCl providing chemical stability for the young shales and clays present in the interval. In production hole a LSND system with polymer and lubricant additives is programmed. Sufficient drill water and mud additives will be on hand to maintain adequate pit volumes and maintain well control.

Hole Section	Fluid type	Interval (MD)	Density (ppg)	Funnel Viscosity	Yield Point	Fluid Loss (cc/30 min)
Surface	Fresh water spud mud	0 – 350	8.4 – 8.8	32 – 44	2 – 12	NC
Intermediate	7% KCl Low solids, non-dispersed	350 – 5514	9.0 – 9.5	38 – 45	8 – 14	<20
Production	Low solids, non-dispersed	5514 – 15705	8.8 – 9.2	34 – 38	6 – 8	6 – 8

Cores, tests and logs

Wellbore surveying: Drift (inclination only) surveys will be obtained in surface hole. MWD directional surveys will be taken in intermediate and production hole.

Logging while drilling: None in surface hole. MWD GR in intermediate and production hole.

Mud logging: a two-person mud logging unit with C1 – C4 gas analysis will be operational in intermediate and production hole.

Electric logging: No open hole electric logs are programmed. A cased hole GR/CCL will be run during completions for perforating depth control.

Cuttings and drilling fluids management

A closed loop, steel tank-based circulating system will be used. In addition to the rig solids control equipment, a dewatering centrifuge and chemical flocculation system will be operational to strip solids from the whole mud. All solids will be collected in 3-sided bins and will then be put into transports with a bucket loader. Drying agents will be



used if necessary. The solids will be taken to a licensed commercial disposal facility. Whole mud will be dewatered back to drill water and used as make up for subsequent wells or hauled off for disposal. A diagram of the closed loop system is included.

Completion

It is envisioned that this well will be completed with a multi-stage sand frac, using the plug and perf technique. After drilling out the plugs, the current plan is to install a 2-7/8" plunger-assisted gas lift tubing string. The stimulation and completion plan will be sundried at a later date.



Pad name : J31 2307
Well name : NAU 529H

SHL Latitude : 36.18212900
SHL Longitude : -107.61505100

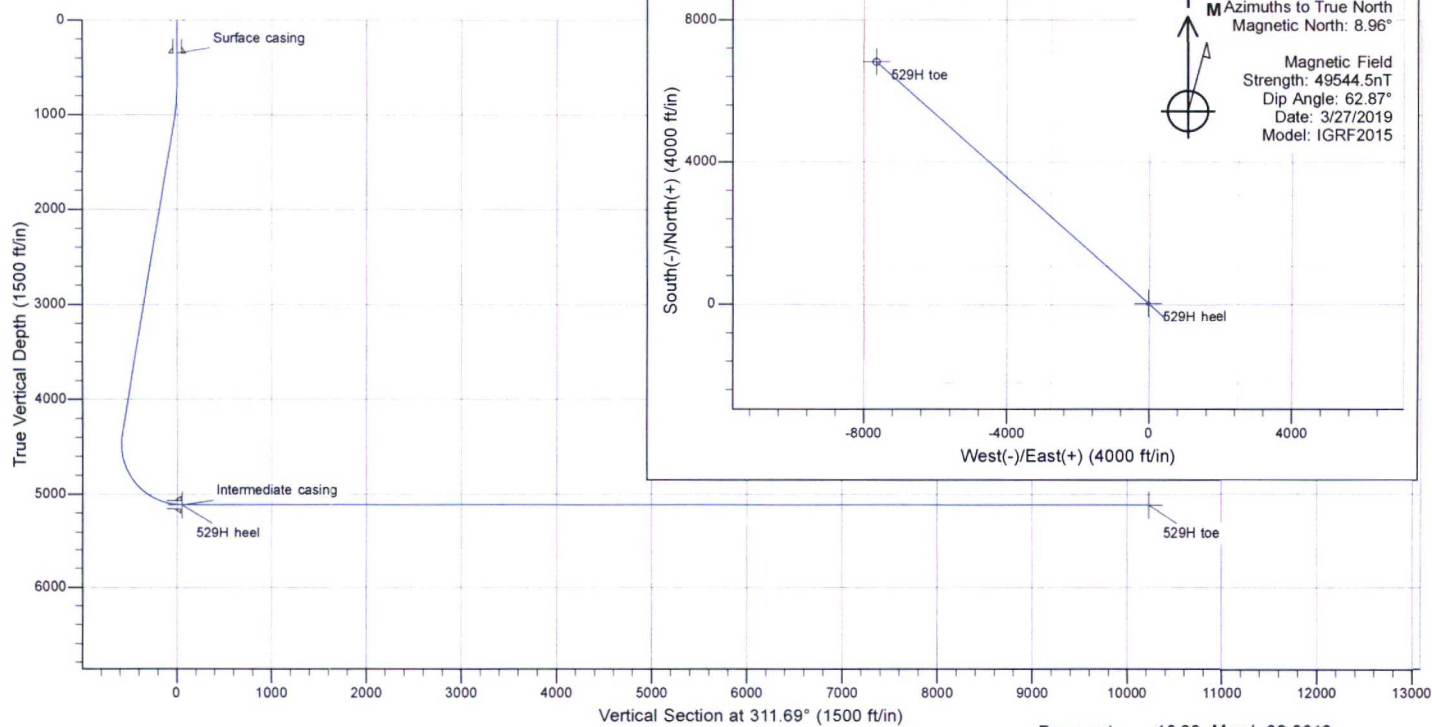
US State Plane 1983
North American Datum 1983
New Mexico Western Zone

TRAJECTORY DETAILS
Pad elevation : 6979 RKB (copy) @ 6993ft (RIG TBD)

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0	0.00	0.00	0	0	0	0.00	0.00	0	
650	0.00	0.00	650	0	0	0.00	0.00	0	
1120	9.41	131.63	1118	-26	29	2.00	131.63	-39	
4420	9.41	131.63	4373	-384	432	0.00	0.00	-578	
5524	90.00	311.68	5114	34	-37	9.00	-179.95	50	529H heel
15705	90.00	311.68	5114	6804	-7640	0.00	0.00	10230	529H toe

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
529H heel	5114	34	-37	1885698	2787471	36.18222200	-107.61517670
529H toe	5114	6804	-7640	1892451	2779853	36.20081660	-107.64094660



Prepared : 16:22, March 28 2019



DJR Operating

North Alamito Unit

J31 2307

NAU 529H

Original drilling

Plan: APD

Standard Planning Report

28 March, 2019

Planning Report

Database: EDM
Company: DJR Operating
Project: North Alamito Unit
Site: J31 2307
Well: NAU 529H
Wellbore: Original drilling
Design: APD

Local Co-ordinate Reference: Well NAU 529H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	North Alamito Unit		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	J31 2307		
Site Position:		Northing:	1,885,650 usft
From:	Lat/Long	Easting:	2,787,495 usft
Position Uncertainty:	0 ft	Slot Radius:	13.200 in
		Latitude:	36.18208900
		Longitude:	-107.61509700
		Grid Convergence:	0.13 °

Well	NAU 529H		
Well Position	+N/-S	15 ft	Northing: 1,885,664 usft
	+E/-W	14 ft	Easting: 2,787,508 usft
Position Uncertainty		0 ft	Wellhead Elevation:
			Latitude: 36.18212900
			Longitude: -107.61505100
			Ground Level: 6979 ft

Wellbore	Original drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/27/2019	8.96	62.87	49,544.46089392

Design	APD			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0	0	0	311.69

Plan Survey Tool Program	Date	3/28/2019		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0	15,705 APD (Original drilling)	MWD+IGRF	
			OWSG MWD + IGRF or WMM	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0	0.00	0.00	0	0	0	0.00	0.00	0.00	0.00	
650	0.00	0.00	650	0	0	0.00	0.00	0.00	0.00	
1120	9.41	131.63	1118	-26	29	2.00	2.00	0.00	131.63	
4420	9.41	131.63	4373	-384	432	0.00	0.00	0.00	0.00	
5524	90.00	311.68	5114	34	-37	9.00	7.30	-16.29	-179.95	529H heel
15,705	90.00	311.68	5114	6804	-7640	0.00	0.00	0.00	0.00	529H toe

Planning Report

Database: EDM
Company: DJR Operating
Project: North Alamito Unit
Site: J31 2307
Well: NAU 529H
Wellbore: Original drilling
Design: APD

Local Co-ordinate Reference: Well NAU 529H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
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)
0	0.00	0.00	0	0	0	0	0.00	0.00	0.00
100	0.00	0.00	100	0	0	0	0.00	0.00	0.00
200	0.00	0.00	200	0	0	0	0.00	0.00	0.00
300	0.00	0.00	300	0	0	0	0.00	0.00	0.00
350	0.00	0.00	350	0	0	0	0.00	0.00	0.00
Surface casing									
400	0.00	0.00	400	0	0	0	0.00	0.00	0.00
500	0.00	0.00	500	0	0	0	0.00	0.00	0.00
600	0.00	0.00	600	0	0	0	0.00	0.00	0.00
650	0.00	0.00	650	0	0	0	0.00	0.00	0.00
700	1.00	131.63	700	0	0	0	2.00	2.00	0.00
800	3.00	131.63	800	-3	3	-4	2.00	2.00	0.00
889	4.79	131.63	889	-7	7	-10	2.00	2.00	0.00
Ojo Alamo									
900	5.00	131.63	900	-7	8	-11	2.00	2.00	0.00
929	5.59	131.63	929	-9	10	-14	2.00	2.00	0.00
Kirtland									
1000	7.00	131.63	999	-14	16	-21	2.00	2.00	0.00
1100	9.00	131.63	1098	-23	26	-35	2.00	2.00	0.00
1120	9.41	131.63	1118	-26	29	-39	2.00	2.00	0.00
1175	9.41	131.63	1172	-32	35	-47	0.00	0.00	0.00
Fruitland									
1200	9.41	131.63	1197	-34	39	-52	0.00	0.00	0.00
1300	9.41	131.63	1295	-45	51	-68	0.00	0.00	0.00
1400	9.41	131.63	1394	-56	63	-84	0.00	0.00	0.00
1463	9.41	131.63	1456	-63	71	-94	0.00	0.00	0.00
Picture Cliffs									
1500	9.41	131.63	1493	-67	75	-101	0.00	0.00	0.00
1600	9.41	131.63	1591	-78	87	-117	0.00	0.00	0.00
1633	9.41	131.63	1624	-81	91	-122	0.00	0.00	0.00
Lewis									
1700	9.41	131.63	1690	-89	100	-133	0.00	0.00	0.00
1800	9.41	131.63	1789	-99	112	-150	0.00	0.00	0.00
1900	9.41	131.63	1887	-110	124	-166	0.00	0.00	0.00
2000	9.41	131.63	1986	-121	136	-182	0.00	0.00	0.00
2100	9.41	131.63	2085	-132	148	-199	0.00	0.00	0.00
2200	9.41	131.63	2183	-143	161	-215	0.00	0.00	0.00
2239	9.41	131.63	2222	-147	165	-221	0.00	0.00	0.00
Chacra									
2300	9.41	131.63	2282	-154	173	-231	0.00	0.00	0.00
2400	9.41	131.63	2381	-165	185	-248	0.00	0.00	0.00
2500	9.41	131.63	2479	-175	197	-264	0.00	0.00	0.00
2600	9.41	131.63	2578	-186	210	-280	0.00	0.00	0.00
2700	9.41	131.63	2677	-197	222	-297	0.00	0.00	0.00
2800	9.41	131.63	2775	-208	234	-313	0.00	0.00	0.00
2900	9.41	131.63	2874	-219	246	-329	0.00	0.00	0.00
2929	9.41	131.63	2903	-222	250	-334	0.00	0.00	0.00
Cliffhouse									
2970	9.41	131.63	2943	-226	255	-341	0.00	0.00	0.00
Menefee									
3000	9.41	131.63	2973	-230	258	-346	0.00	0.00	0.00
3100	9.41	131.63	3071	-241	271	-362	0.00	0.00	0.00
3200	9.41	131.63	3170	-251	283	-378	0.00	0.00	0.00

Planning Report

Database: EDM
Company: DJR Operating
Project: North Alamito Unit
Site: J31 2307
Well: NAU 529H
Wellbore: Original drilling
Design: APD

Local Co-ordinate Reference: Well NAU 529H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
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)
3300	9.41	131.63	3269	-262	295	-395	0.00	0.00	0.00
3400	9.41	131.63	3367	-273	307	-411	0.00	0.00	0.00
3500	9.41	131.63	3466	-284	320	-427	0.00	0.00	0.00
3600	9.41	131.63	3565	-295	332	-444	0.00	0.00	0.00
3700	9.41	131.63	3663	-306	344	-460	0.00	0.00	0.00
3800	9.41	131.63	3762	-317	356	-477	0.00	0.00	0.00
3881	9.41	131.63	3842	-325	366	-490	0.00	0.00	0.00
Point Lookout									
3900	9.41	131.63	3861	-327	368	-493	0.00	0.00	0.00
4000	9.41	131.63	3959	-338	381	-509	0.00	0.00	0.00
4064	9.41	131.63	4022	-345	388	-520	0.00	0.00	0.00
Mancos									
4100	9.41	131.63	4058	-349	393	-526	0.00	0.00	0.00
4200	9.41	131.63	4156	-360	405	-542	0.00	0.00	0.00
4300	9.41	131.63	4255	-371	417	-558	0.00	0.00	0.00
4400	9.41	131.63	4354	-382	429	-575	0.00	0.00	0.00
4402	9.41	131.63	4356	-382	430	-575	0.00	0.00	0.00
Mancos Silt									
4420	9.41	131.63	4373	-384	432	-578	0.00	0.00	0.00
KOP									
4450	6.69	131.61	4403	-387	435	-582	9.00	-9.00	-0.07
4500	2.19	131.46	4453	-389	438	-586	9.00	-9.00	-0.29
4550	2.31	311.89	4503	-389	438	-586	9.00	0.23	-359.15
4600	6.81	311.75	4553	-387	435	-582	9.00	9.00	-0.27
4650	11.31	311.72	4602	-381	429	-574	9.00	9.00	-0.06
4700	15.81	311.71	4651	-374	420	-562	9.00	9.00	-0.02
4750	20.31	311.70	4698	-363	409	-547	9.00	9.00	-0.01
4800	24.81	311.70	4745	-350	394	-528	9.00	9.00	-0.01
4850	29.31	311.70	4789	-335	377	-505	9.00	9.00	-0.01
4899	33.74	311.69	4831	-318	358	-479	9.00	9.00	0.00
Gallup A									
4900	33.81	311.69	4832	-318	358	-479	9.00	9.00	0.00
4941	37.51	311.69	4865	-302	340	-455	9.00	9.00	0.00
Gallup B									
4950	38.31	311.69	4872	-298	336	-449	9.00	9.00	0.00
5000	42.81	311.69	4910	-277	312	-417	9.00	9.00	0.00
5050	47.31	311.69	4945	-253	285	-381	9.00	9.00	0.00
5083	50.27	311.69	4967	-237	267	-357	9.00	9.00	0.00
Gallup C									
5100	51.81	311.69	4978	-228	257	-343	9.00	9.00	0.00
5150	56.31	311.69	5007	-201	227	-303	9.00	9.00	0.00
5200	60.81	311.69	5033	-173	195	-260	9.00	9.00	0.00
5250	65.31	311.69	5056	-143	162	-216	9.00	9.00	0.00
5300	69.81	311.69	5075	-112	127	-170	9.00	9.00	0.00
5314	71.10	311.69	5080	-103	117	-156	9.00	9.00	0.00
Top of liner									
5350	74.31	311.68	5090	-81	91	-122	9.00	9.00	0.00
5400	78.81	311.68	5102	-48	55	-73	9.00	9.00	0.00
5450	83.31	311.68	5110	-15	18	-24	9.00	9.00	0.00
5500	87.81	311.68	5114	18	-19	26	9.00	9.00	0.00
5512	87.81	311.68	5114	26	-28	38	0.00	0.00	0.00
Target									
5514	89.10	311.68	5114	27	-30	40	60.17	60.17	-0.01

Planning Report

Database: EDM
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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)
Intermediate casing									
5524	90.00	311.68	5114	34	-37	50	9.00	9.00	0.00
5584	90.00	311.68	5114	74	-82	110	0.00	0.00	0.00
First take point									
5600	90.00	311.68	5114	84	-94	126	0.00	0.00	0.00
5700	90.00	311.68	5114	151	-168	226	0.00	0.00	0.00
5800	90.00	311.68	5114	217	-243	326	0.00	0.00	0.00
5900	90.00	311.68	5114	284	-318	426	0.00	0.00	0.00
6000	90.00	311.68	5114	350	-392	526	0.00	0.00	0.00
6100	90.00	311.68	5114	417	-467	626	0.00	0.00	0.00
6200	90.00	311.68	5114	483	-542	726	0.00	0.00	0.00
6300	90.00	311.68	5114	550	-616	826	0.00	0.00	0.00
6400	90.00	311.68	5114	616	-691	926	0.00	0.00	0.00
6500	90.00	311.68	5114	683	-766	1026	0.00	0.00	0.00
6600	90.00	311.68	5114	749	-840	1126	0.00	0.00	0.00
6700	90.00	311.68	5114	816	-915	1226	0.00	0.00	0.00
6800	90.00	311.68	5114	882	-990	1326	0.00	0.00	0.00
6900	90.00	311.68	5114	949	-1064	1426	0.00	0.00	0.00
7000	90.00	311.68	5114	1015	-1139	1526	0.00	0.00	0.00
7100	90.00	311.68	5114	1082	-1214	1626	0.00	0.00	0.00
7200	90.00	311.68	5114	1148	-1289	1726	0.00	0.00	0.00
7300	90.00	311.68	5114	1215	-1363	1826	0.00	0.00	0.00
7400	90.00	311.68	5114	1281	-1438	1926	0.00	0.00	0.00
7500	90.00	311.68	5114	1348	-1513	2026	0.00	0.00	0.00
7600	90.00	311.68	5114	1414	-1587	2126	0.00	0.00	0.00
7700	90.00	311.68	5114	1481	-1662	2226	0.00	0.00	0.00
7800	90.00	311.68	5114	1547	-1737	2326	0.00	0.00	0.00
7900	90.00	311.68	5114	1614	-1811	2426	0.00	0.00	0.00
8000	90.00	311.68	5114	1680	-1886	2526	0.00	0.00	0.00
8100	90.00	311.68	5114	1747	-1961	2626	0.00	0.00	0.00
8200	90.00	311.68	5114	1813	-2035	2726	0.00	0.00	0.00
8300	90.00	311.68	5114	1880	-2110	2826	0.00	0.00	0.00
8400	90.00	311.68	5114	1946	-2185	2926	0.00	0.00	0.00
8500	90.00	311.68	5114	2013	-2259	3026	0.00	0.00	0.00
8600	90.00	311.68	5114	2079	-2334	3126	0.00	0.00	0.00
8700	90.00	311.68	5114	2146	-2409	3226	0.00	0.00	0.00
8800	90.00	311.68	5114	2212	-2483	3326	0.00	0.00	0.00
8900	90.00	311.68	5114	2279	-2558	3426	0.00	0.00	0.00
9000	90.00	311.68	5114	2345	-2633	3526	0.00	0.00	0.00
9100	90.00	311.68	5114	2412	-2708	3626	0.00	0.00	0.00
9200	90.00	311.68	5114	2478	-2782	3726	0.00	0.00	0.00
9300	90.00	311.68	5114	2545	-2857	3826	0.00	0.00	0.00
9400	90.00	311.68	5114	2611	-2932	3926	0.00	0.00	0.00
9500	90.00	311.68	5114	2678	-3006	4026	0.00	0.00	0.00
9600	90.00	311.68	5114	2744	-3081	4126	0.00	0.00	0.00
9700	90.00	311.68	5114	2811	-3156	4226	0.00	0.00	0.00
9800	90.00	311.68	5114	2877	-3230	4326	0.00	0.00	0.00
9900	90.00	311.68	5114	2944	-3305	4426	0.00	0.00	0.00
10,000	90.00	311.68	5114	3010	-3380	4526	0.00	0.00	0.00
10,100	90.00	311.68	5114	3077	-3454	4626	0.00	0.00	0.00
10,200	90.00	311.68	5114	3143	-3529	4726	0.00	0.00	0.00
10,300	90.00	311.68	5114	3210	-3604	4826	0.00	0.00	0.00
10,400	90.00	311.68	5114	3276	-3678	4926	0.00	0.00	0.00
10,500	90.00	311.68	5114	3343	-3753	5026	0.00	0.00	0.00

Planning Report

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Wellbore: Original drilling
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MD Reference: RKB (copy) @ 6993ft (RIG TBD)
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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)
10,600	90.00	311.68	5114	3409	-3828	5126	0.00	0.00	0.00
10,700	90.00	311.68	5114	3476	-3903	5226	0.00	0.00	0.00
10,800	90.00	311.68	5114	3542	-3977	5326	0.00	0.00	0.00
10,900	90.00	311.68	5114	3609	-4052	5426	0.00	0.00	0.00
11,000	90.00	311.68	5114	3675	-4127	5526	0.00	0.00	0.00
11,100	90.00	311.68	5114	3742	-4201	5626	0.00	0.00	0.00
11,200	90.00	311.68	5114	3808	-4276	5726	0.00	0.00	0.00
11,300	90.00	311.68	5114	3875	-4351	5826	0.00	0.00	0.00
11,400	90.00	311.68	5114	3941	-4425	5926	0.00	0.00	0.00
11,500	90.00	311.68	5114	4008	-4500	6026	0.00	0.00	0.00
11,600	90.00	311.68	5114	4074	-4575	6126	0.00	0.00	0.00
11,700	90.00	311.68	5114	4141	-4649	6226	0.00	0.00	0.00
11,800	90.00	311.68	5114	4207	-4724	6326	0.00	0.00	0.00
11,900	90.00	311.68	5114	4274	-4799	6426	0.00	0.00	0.00
12,000	90.00	311.68	5114	4340	-4873	6526	0.00	0.00	0.00
12,100	90.00	311.68	5114	4407	-4948	6626	0.00	0.00	0.00
12,200	90.00	311.68	5114	4473	-5023	6726	0.00	0.00	0.00
12,300	90.00	311.68	5114	4540	-5097	6826	0.00	0.00	0.00
12,400	90.00	311.68	5114	4606	-5172	6926	0.00	0.00	0.00
12,500	90.00	311.68	5114	4673	-5247	7026	0.00	0.00	0.00
12,600	90.00	311.68	5114	4739	-5322	7126	0.00	0.00	0.00
12,700	90.00	311.68	5114	4806	-5396	7226	0.00	0.00	0.00
12,800	90.00	311.68	5114	4872	-5471	7326	0.00	0.00	0.00
12,900	90.00	311.68	5114	4939	-5546	7426	0.00	0.00	0.00
13,000	90.00	311.68	5114	5005	-5620	7526	0.00	0.00	0.00
13,100	90.00	311.68	5114	5072	-5695	7626	0.00	0.00	0.00
13,200	90.00	311.68	5114	5138	-5770	7726	0.00	0.00	0.00
13,300	90.00	311.68	5114	5205	-5844	7826	0.00	0.00	0.00
13,400	90.00	311.68	5114	5271	-5919	7926	0.00	0.00	0.00
13,500	90.00	311.68	5114	5338	-5994	8026	0.00	0.00	0.00
13,600	90.00	311.68	5114	5404	-6068	8126	0.00	0.00	0.00
13,700	90.00	311.68	5114	5471	-6143	8226	0.00	0.00	0.00
13,800	90.00	311.68	5114	5537	-6218	8326	0.00	0.00	0.00
13,900	90.00	311.68	5114	5604	-6292	8426	0.00	0.00	0.00
14,000	90.00	311.68	5114	5670	-6367	8526	0.00	0.00	0.00
14,100	90.00	311.68	5114	5737	-6442	8626	0.00	0.00	0.00
14,200	90.00	311.68	5114	5803	-6516	8726	0.00	0.00	0.00
14,300	90.00	311.68	5114	5870	-6591	8826	0.00	0.00	0.00
14,400	90.00	311.68	5114	5936	-6666	8926	0.00	0.00	0.00
14,500	90.00	311.68	5114	6003	-6741	9026	0.00	0.00	0.00
14,600	90.00	311.68	5114	6069	-6815	9126	0.00	0.00	0.00
14,700	90.00	311.68	5114	6136	-6890	9226	0.00	0.00	0.00
14,800	90.00	311.68	5114	6202	-6965	9326	0.00	0.00	0.00
14,900	90.00	311.68	5114	6269	-7039	9426	0.00	0.00	0.00
15,000	90.00	311.68	5114	6335	-7114	9526	0.00	0.00	0.00
15,100	90.00	311.68	5114	6402	-7189	9626	0.00	0.00	0.00
15,200	90.00	311.68	5114	6468	-7263	9726	0.00	0.00	0.00
15,300	90.00	311.68	5114	6535	-7338	9826	0.00	0.00	0.00
15,400	90.00	311.68	5114	6601	-7413	9926	0.00	0.00	0.00
15,500	90.00	311.68	5114	6668	-7487	10,026	0.00	0.00	0.00
15,600	90.00	311.68	5114	6734	-7562	10,126	0.00	0.00	0.00
15,645	90.00	311.68	5114	6764	-7595	10,171	0.00	0.00	0.00

Last take point

Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well NAU 529H
Company:	DJR Operating	TVD Reference:	RKB (copy) @ 6993ft (RIG TBD)
Project:	North Alamito Unit	MD Reference:	RKB (copy) @ 6993ft (RIG TBD)
Site:	J31 2307	North Reference:	True
Well:	NAU 529H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original drilling		
Design:	APD		

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)
15,705	90.00	311.68	5114	6804	-7640	10,230	0.00	0.00	0.00

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
529H heel - plan hits target center - Circle (radius 50)	0.00	0.00	5114	34	-37	1,885,698	2,787,471	36.18222200	-107.61517670
529H toe - plan hits target center - Circle (radius 100)	0.00	0.00	5114	6804	-7640	1,892,451	2,779,853	36.20081660	-107.64094660

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
350	350	Surface casing	9.625	12.250
5514	5114	Intermediate casing	7.000	8.750

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
889	889	Ojo Alamo		0.00	
929	929	Kirtland		0.00	
1175	1172	Fruitland		0.00	
1463	1456	Picture Cliffs		0.00	
1633	1624	Lewis		0.00	
2239	2222	Chacra		0.00	
2929	2903	Cliffhouse		0.00	
2970	2943	Menefee		0.00	
3881	3842	Point Lookout		0.00	
4064	4022	Mancos		0.00	
4402	4356	Mancos Silt		0.00	
4899	4831	Gallup A		0.00	
4941	4865	Gallup B		0.00	
5083	4967	Gallup C		0.00	
5512	5114	Target		0.00	

Planning Report

Database: EDM Company: DJR Operating Project: North Alamito Unit Site: J31 2307 Well: NAU 529H Wellbore: Original drilling Design: APD	Local Co-ordinate Reference: Well NAU 529H TVD Reference: RKB (copy) @ 6993ft (RIG TBD) MD Reference: RKB (copy) @ 6993ft (RIG TBD) North Reference: True Survey Calculation Method: Minimum Curvature
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Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4420	4373	-384	432	KOP
5314	5080	-103	117	Top of liner
5584	5114	74	-82	First take point
15,645	5114	6764	-7595	Last take point



DJR Operating

North Alamito Unit

J31 2307

NAU 529H

Original drilling

APD

Anticollision Report

28 March, 2019

Anticollision Report

Company:	DJR Operating	Local Co-ordinate Reference:	Well NAU 529H
Project:	North Alamo Unit	TVD Reference:	RKB (copy) @ 6993ft (RIG TBD)
Reference Site:	J31 2307	MD Reference:	RKB (copy) @ 6993ft (RIG TBD)
Site Error:	0 ft	North Reference:	True
Reference Well:	NAU 529H	Survey Calculation Method:	Minimum Curvature
Well Error:	0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original drilling	Database:	EDM
Reference Design:	APD	Offset TVD Reference:	Offset Datum

Reference	APD		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	3/28/2019		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0	15,705	APD (Original drilling)	MWD+IGRF	OWSG MWD + IGRF or WMM	

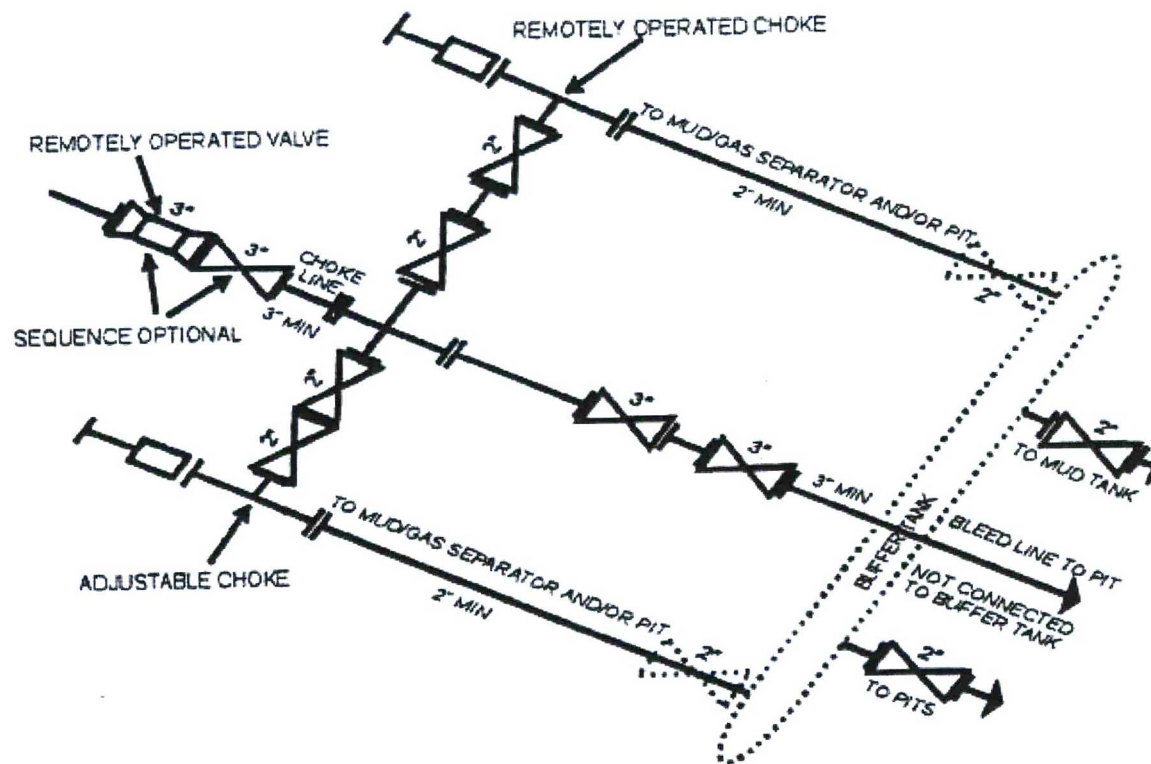
Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
J31 2307						
NAU 332H - Original drilling - APD	403	403	70	67	28.027	CC
NAU 332H - Original drilling - APD	500	499	70	67	22.102	ES
NAU 332H - Original drilling - APD	14,900	14,912	888	395	1.801	SF
NAU 333H - Original drilling - APD	504	504	20	17	6.218	CC
NAU 333H - Original drilling - APD	600	600	20	16	5.217	ES
NAU 333H - Original drilling - APD	650	649	21	17	5.051	SF
NAU 528H - Original drilling - APD	404	404	20	17	8.021	CC
NAU 528H - Original drilling - APD	500	500	20	17	6.360	ES
NAU 528H - Original drilling - APD	650	649	24	20	5.684	SF
NAU 559H - Original drilling - APD	993	995	16	10	2.440	CC, ES
NAU 559H - Original drilling - APD	15,705	16,047	1011	474	1.882	SF

Offset Design J31 2307 - NAU 332H - Original drilling - APD												Offset Site Error:	0 ft
Survey Program: 0-MWD+IGRF												Offset Well Error:	0 ft
Reference Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0	0	0	0	0	0	-137.95	-52	-47	70				
100	100	100	100	0	0	-137.95	-52	-47	70	69	0.31	225.808	
200	200	200	200	1	1	-137.95	-52	-47	70	69	1.03	67.900	
300	300	300	300	1	1	-137.95	-52	-47	70	68	1.74	39.958	
400	400	400	400	1	1	-137.95	-52	-47	70	67	2.46	28.308	
403	403	403	403	1	1	-137.95	-52	-47	70	67	2.48	28.027	CC
500	500	499	499	2	2	-138.17	-52	-47	70	67	3.16	22.102	ES
600	600	597	597	2	2	-139.90	-55	-47	73	69	3.85	18.857	
650	650	646	646	2	2	-141.32	-58	-47	75	71	4.19	17.862	
700	700	695	695	2	2	85.62	-62	-47	78	73	4.53	17.205	
800	800	792	791	3	3	83.80	-72	-47	86	81	5.20	16.530	
900	900	889	887	3	3	83.15	-85	-47	97	91	5.89	16.384	
1000	999	985	982	3	3	83.37	-102	-48	109	103	6.60	16.574	
1100	1098	1081	1076	4	4	84.15	-121	-48	125	117	7.34	16.975	
1120	1118	1100	1095	4	4	84.35	-125	-48	128	120	7.49	17.081	
1200	1197	1178	1171	4	4	85.29	-143	-48	142	134	8.14	17.418	

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

Choke Manifold

Actual system to conform with Onshore Order 2



Proposed BOP stack
11" 3M RRA



Double gate with integral choke/kill outlets

Kill line
2" minimum diameter

Choke line
3" minimum diameter

Low pressure rotating head

Flowline

3M Annular preventer

3M Pipe rams

3M Blind rams

Tie-down flange
(moves with BOP)

11" 5M Multi-bowl casing head

