

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

APR 23 2019

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

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		5. Lease Serial No. NO-G-1402-1893
1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
2. Name of Operator Enduring Resources IV LLC		7. If Unit of CA/Agreement, Name and/or No. NMNM 136328A
3a. Address 200 Energy Court Farmington NM 87401	3b. Phone No. (include area code) 505-636-9743	8. Well Name and No. RODEO UNIT #493H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SHL: 225' FNL & 915' FWL Sec 31 T23N R8W Unit: D BHL: 330' FSL & 649' FWL Sec 32 T22N R8W Unit: M		9. API Well No. 30-045-35724
		10. Field and Pool or Exploratory Area Basin Mancos
		11. Country or Parish, State San Juan, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other <u>Change in Plans</u>
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleation in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has detennined that the site is ready for final inspection.)

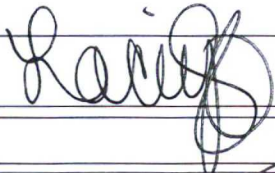
**ADHERE TO PREVIOUS NMOCD
CONDITIONS OF APPROVAL**

Enduring Resources requests a change in plans per updated C102, wellbore, directional and ops plans.

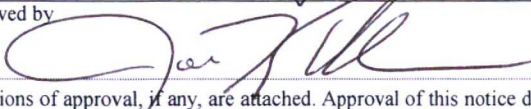
NMOCD

MAY 30 2019

DISTRICT III

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Lacey Granillo	Title: Permit Specialist
Signature 	Date: 4/22/19

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by 	Petro Engr Title	Date 20 MAY 2019
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.	Office FFO	

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.

NMOCD

14

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 30-045-35724		Pool Code 97232	Pool Name BASIN MANCOS
Property Code 321253	Property Name RODEO UNIT		Well Number 493H
GRID No. 372286	Operator Name ENDURING RESOURCES, LLC		Elevation 6680'

10 Surface Location

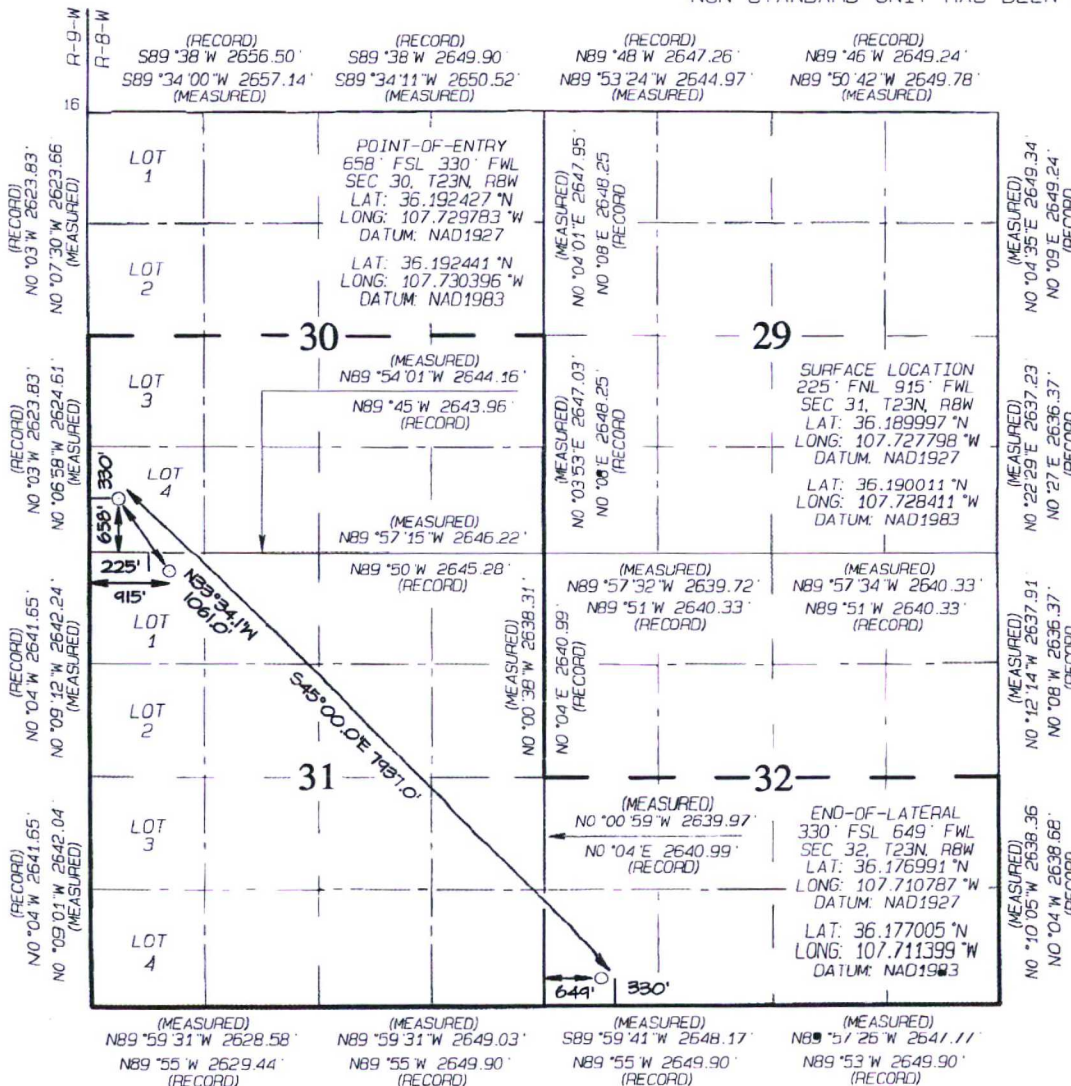
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	31	23N	8W	1	225	NORTH	915	WEST	SAN JUAN

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
M	32	23N	8W		330	SOUTH	649	WEST	SAN JUAN

Dedicated Acres 1283.63	S/2 - Section 30 Entire Section 31 S/2 - Section 32	Joint or Infill	Consolidation Code	Order No. R-14313
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION
UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A
NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: Lacey Graniilo Date: 4/22/19	
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: MARCH 26, 2019 Date of Survey: APRIL 12, 2019 Signature and Seal of Professional Surveyor Jason C. Edwards Certificate Number 15269	



ENDURING RESOURCES IV, LLC
1050 SEVENTEENTH STREET, SUITE 2500
DENVER, COLORADO 80265

DRILLING PLAN: *Drill, complete, and equip single lateral in the Mancos-I formation*

WELL INFORMATION:

Name: RODEO UNIT 493H

API Number: 30-045-35724

State: New Mexico

County: San Juan

Surface Elevation: 6,680 ft ASL (GL) 6,705 ft ASL (KB)

Surface Location: 31-23N-08W Sec-Twn-Rng 225 ft FNL 915 ft FWL
36.190011 ° N latitude 107.728411 ° W longitude (NAD 83)

BH Location: 32-23N-08W Sec-Twn-Rng 330 ft FSL 649 ft FWL
36.177005 ° N latitude 107.711399 ° W longitude (NAD 83)

Driving Directions: FROM THE INTERSECTION OF US HWY 550 & US HWY 64 IN BLOOMFIELD, NM: South on US Hwy 550 for 38.7 miles to MM 112.7; Right (South) on CR 7900 for 2.3 miles to fork; Right (West) on 7940 for 2.6 miles, Right (North-West) on new acces road for approximately 0.2 miles to Rodeo Unit 492H Pad (includes wells 492H, 493H, 494H, 495H, 496H).

GEOLOGIC AND RESERVOIR INFORMATION:

Prognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,416	289	289	W	normal
	Kirtland	6,289	416	416	W	normal
	Fruitland	6,088	617	617	G, W	sub
	Pictured Cliffs	5,739	966	968	G, W	sub
	Lewis	5,486	1,219	1,230	G, W	normal
	Chacra	5,356	1,349	1,370	G, W	normal
	Cliff House	4,277	2,428	2,602	G, W	sub
	Menefee	4,266	2,439	2,615	G, W	normal
	Point Lookout	3,291	3,414	3,733	G, W	normal
	Mancos	3,080	3,625	3,976	O,G	sub (~0.38)
	Gallup (MNCS_A)	2,847	3,858	4,243	O,G	sub (~0.38)
	MNCS_I	2,120	4,585	5,147	O,G	sub (~0.38)
	P.O.E. TARGET	2,095	4,610	5,317	O,G	sub (~0.38)
	PROJECTED TD	2,165	4,540	13,255	O,G	sub (~0.38)

Surface: Nacimiento

Oil & Gas Zones: Several gas bearing zones will be encountered; target formation is the Gallup

Pressure: Normal (0.43 psi/ft) or sub-normal pressure gradients anticipated in all formations

Max. pressure gradient: 0.43 psi/ft Evacuated hole gradient: 0.22 psi/ft

Maximum anticipated BH pressure, assuming maximum pressure gradient: 1,990 psi

Maximum anticipated surface pressure, assuming partially evacuated hole: 980 psi

Temperature: Maximum anticipated BHT is 130° F or less

H₂S INFORMATION:

H₂S Zones: Encountering hydrogen-sulfide bearing zones is **NOT** anticipated.

Safety: Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

LOGGING, CORING, AND TESTING:

Mud Logs: None planned; gas detection from drill out of 13-3/8" casing to TD; remote geo-steering from drill out of 9-5/8" casing to TD.

MWD / LWD: MWD surveys with inclination and azimuth in 100' stations (minimum) from drill out of 13-3/8" casing to TD; Gamma Ray from drill out of 9-5/8" casing to TD; Gamma Ray optional in 12-1/4" intermediate hole

Open Hole Logs: None planned

Testing: None planned

Coring: None planned

Cased Hole Logs: CBL on 5-1/2" casing from deepest free-fall depth to surface

DRILLING RIG INFORMATION:

Contractor: Aztec

Rig No.: 1000

Draw Works: E80 AC 1,500 hp

Mast: Hyduke Triple (136 ft, 600,000 lbs, 10 lines)

Top Drive: NOV IDS-350PE (350 ton)

Prime Movers: 4 - GE Jenbacher Natural Gas Generator

Pumps: 2 - RS F-1600 (7,500 psi)

BOPE 1: Cameron double gate ram (13-5/8", 3,000 psi)

BOPE 2: Cameron annular (13-5/8", 5,000 psi)

Choke: Cameron (4", 10,000 psi)

KB-Gl (ft): 25

Note: Actual drilling rig may vary depending on availability at time the well is scheduled to be drilled.

BOPE REQUIREMENTS:

See attached diagram for details regarding BOPE specifications and configuration.

- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2) Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well.
- 2) BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum.
- 3) BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) if the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psig for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally, BOP and casing strings will be tested to .22 psi/ft or 1,500 psi, whichever is greater but not exceeding 70% of yield strength of the casing, for 30 minutes, prior to drilling out 13-3/8" and 9-5/8" casing. Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.
- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be installed on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when there is no power to the accumulator.

FLUIDS AND SOLIDS CONTROL PROGRAM:

- Fluid Measurement:** Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and after mudding up, at a minimum, on the drilling report. A Pit Volume Totalizer will be installed and the readout will be displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the dog-house and the in the geologist's work-station (if geologist or mud-logger is on-site).
- Closed-Loop System:** A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimize the amount of fluids and solids that require disposal.
- Fluid Disposal:** Fluids that cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).
- Solids Disposal:** Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products. Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).
- Fluid Program:** See "Detailed Drilling Plan" section for specifics.

DETAILED DRILLING PLAN:

SURFACE: Drill vertically to casing setting depth (plus necessary rathole), run casing, cement casing to surface.

0 ft (MD)	to	350 ft (MD)	Hole Section Length:	350 ft
0 ft (TVD)	to	350 ft (TVD)	Casing Required:	350 ft

Note: Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.

Fluid:	Type	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	pH	Comments
	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spud mud

Hole Size: 17-1/2"

Bit / Motor: Mill Tooth or PDC, no motor

MWD / Survey: No MWD, deviation survey

Logging: None

Casing Specs: Specs Loading Min. S.F.		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
	13.375	54.5	J-55	BTC	1,130	2,730	853,000	909,000
					153	802	116,634	116,634
					7.39	3.40	7.31	7.79

Assumptions: Collapse: fully evacuated casing with 8.4 ppg equivalent external pressure gradient

Burst: maximum anticipated surface pressure with 9.5 ppg fluid inside casing while drilling intermediate hole and 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 8.4 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Minimum: N/A Optimum: N/A Maximum: N/A

Make-up as per API Buttress Connection running procedure.

Casing Details: Float shoe, 1 jt casing, float collar, casing to surface

Centralizers: 2 centralizers per jt stop-banded 10' from each collar on bottom 3 jts, 1 centralizer per 2 jts to surface

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	Hole Cap. (cuft/ft)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
	Class G	15.8	1.174	5.15	0.6946	100%	0	414

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton HALCEM surface cementing blend

Notify NMOCD & BLM if cement is not circulated to surface. Cement must achieve 500 psi compressive strength before drilling out.

INTERMEDIATE: Drill as per directional plan to casing setting depth, run casing, cement casing to surface.

350 ft (MD)	to	4,090 ft (MD)	Hole Section Length:	3,740 ft
350 ft (TVD)	to	3,725 ft (TVD)	Casing Required:	4,090 ft

Fluid:	Type	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	pH	Comments
	LSND	8.8 - 9.5	20	8 - 14	8 - 14	9.0 - 9.5	

Hole Size: 12-1/4"

Bit / Motor: PDC w/mud motor

MWD / Survey: MWD surveys with inclination and azimuth in 100' stations (minimum), GR optional

Logging: None

Pressure Test: NU BOPE and test (as noted above); pressure test 13-3/8" casing to 1,500 psi for 30 minutes.

Casing Specs:	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	9.625	36.0	J-55	LTC	2,020	3,520	564,000
Loading					1,627	1,193	228,400
Min. S.F.					1.24	2.95	2.47

Assumptions: Collapse: fully evacuated casing with 8.4 ppg equivalent external pressure gradient

Burst: maximum anticipated surface pressure with 9.5 ppg fluid inside casing while drilling production hole and 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 8.4 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Minimum: 3,900 Optimum: 5,200 Maximum: 6,500

Casing Details: Float shoe, 1 jt casing, float collar, casing to surface

Centralizers: 2 centralizers per jt stop-banded 10' from each collar on bottom 3 jts, 1 centralizer per 2 jts to surface

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
Lead	G:POZ Blend	12.3	1.987	10.16	40%	0	804
Tail	Class G	15.8	1.148	4.98	10%	3,590	150

Annular Capacity 0.3627 cuft/ft 9-5/8" casing x 13-3/8" casing annulus

0.3132 cuft/ft 9-5/8" casing x 12-1/4" hole annulus

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton ECONOCHEM & HALCEM cementing blend

Notify NMOCD & BLM if cement is not circulated to surface. Cement must achieve 500 psi compressive strength before drilling out.

PRODUCTION: Drill to TD following directional plan, run casing, cement casing to surface.

4,090 ft (MD)	to	13,255 ft (MD)	Hole Section Length:	9,165 ft
3,725 ft (TVD)	to	4,540 ft (TVD)	Casing Required:	13,255 ft

Estimated KOP:	4,119 ft (MD)	3,750 ft (TVD)
Estimated Landing Point (P.O.E.):	5,317 ft (MD)	4,610 ft (TVD)
Estimated Lateral Length:	7,938 ft (MD)	

Fluid:	Type	MW (ppg)	FL (mL/30')	PV (cp)	YP (lb/100 sqft)	pH	Comments
	LSND	8.8 - 9.5	20	8 - 14	8 - 14	9.0 - 9.5	OBM as contingency

Hole Size: 8-1/2"

Bit / Motor: PDC w/mud motor

MWD / Survey: MWD surveys with inclination and azimuth in 100' stations (minimum) before KOP, every joint from KOP to POE, every 100' (minimum) from POE to TD; Gamma Ray from drill out of 9-5/8" shoe to TD

Logging: MWD Gamma Ray for entire section, no mud-log or cuttings sampling, no OH WL logs

Pressure Test: NU BOPE and test (as noted above); pressure test 9-5/8" casing to **1,500** psi for 30 minutes.

Casing Specs:	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,243	8,925	294,444	294,444
Min. S.F.					3.33	1.19	1.85	1.51

Assumptions: Collapse: fully evacuated casing with 9.5 ppg fluid in the annulus (floating casing during running)
 Burst: 8,500 psi maximum surface treating pressure with 10.2 ppg equivalent mud weight sand laden fluid with 8.4 ppg equivalent external pressure gradient
 Tension: buoyed weight in 9.0 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Minimum: 3,400 Optimum: 4,530 Maximum: 5,660

Casing Details: Float shoe, float collar, 2 jts casing, float collar, 1 jt casing, toe-initiation sleeve, 20' marker joint, toe-initiation sleeve, casing to KOP with 20' marker joints spaced evenly in lateral every 2,000'. Place Floatation Sub at KOP. Continue running casing to surface. **The toe-initiation sleeves must be positioned INSIDE the 330' unit setback.**

Centralizers: Centralizer count and placement may be adjusted based on well conditions and as-drilled surveys.

Lateral: 1 centralizer per joint

POE to KOP: 1 centralizer per joint from landing point to KOP

KOP to surface: 1 centralizer per 2 joints from KOP to 9-5/8" shoe, 1 per 3 joints from 9-5/8" shoe to surface

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
Lead	G:POZ blend	12.4	1.907	9.98	40%	0	834
Tail	G:POZ blend	13.3	1.360	6.00	10%	4,243	1,670

Annular Capacity 0.2691 cuft/ft 5-1/2" casing x 9-5/8" casing annulus

0.2291 cuft/ft 5-1/2" casing x 8-1/2" hole annulus

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton ECONOCEM & EXTENDACEM cementing blend

Notify NMOCD & BLM if cement is not circulated to surface.

Note: The lateral may be drilled past applicable setback to maximize the length of the completed interval and to maximize resource recovery. If the well is drilled past the setback, the toe initiation sleeve and all perforations will be placed inside the setback. An unorthodox location application is not required because the completed interval will be entirely within the setback as defined and allowed by NMAC 19.15.16.7B(1), NMAC 19.15.16.14B(2), NMAC 19.15.16.15B(2). Rodeo Unit Order Number is R-14313.

FINISH WELL: ND BOP, NU WH, RDMO.

COMPLETION AND PRODUCTION PLAN:

Frac: Lateral will be fracture-stimulated in approximately 45 plug-and-perf stages with approximately 180,000 bbls slickwater fluid and 15,000,000 lbs of proppant.

Flowback: Well will be flowed back through production tubing. An ESP may be used to assist in load water recovery.

Production: Well will produce up production tubing via gas-lift into permanent production and storage facilities.

ESTIMATED START DATES:

Drilling: 6/1/2019

Completion: 7/16/2019

Production: 8/15/2019

Prepared by: Alec Bridge 4/17/2019



Enduring Resources LLC

San Juan Basin - Rodeo Unit

492H Pad

493H

Wellbore #1

Plan: Design #1

Standard Planning Report

17 April, 2019



Planning Report

Database: EDM
Company: Enduring Resources LLC
Project: San Juan Basin - Rodeo Unit
Site: 492H Pad
Well: 493H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 493H
TVD Reference: KB @ 6705.0usft (Original Well Elev)
MD Reference: KB @ 6705.0usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	San Juan Basin - Rodeo 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	492H Pad, San Juan County, New Mexico				
Site Position:		Northing:	1,888,477.95 usft	Latitude:	36.190011°N
From:	Lat/Long	Easting:	2,754,011.92 usft	Longitude:	107.728546°W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well	493H, lower target					
Well Position	+N/-S	0.0 usft	Northing:	1,888,477.99 usft	Latitude:	36.190011°N
	+E/-W	39.8 usft	Easting:	2,754,051.76 usft	Longitude:	107.728411°W
Position Uncertainty	0.0 usft		Wellhead Elevation:		Ground Level:	6,680.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.97	63.04	50,595.12689574

Design	Design #1				
Audit Notes:					
Version:	Phase:	PROTOTYPE		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	133.25	

Plan Survey Tool Program	Date 4/17/2019				
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.0	13,254.8	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,579.4	29.38	320.44	1,537.0	189.4	-156.5	3.00	3.00	0.00	320.44	
4,119.0	29.38	320.44	3,750.0	1,150.0	-950.0	0.00	0.00	0.00	0.00	493H KOP
4,152.4	32.80	322.10	3,778.6	1,163.5	-980.8	10.56	10.25	4.96	14.74	
5,317.2	90.51	135.00	4,610.0	883.9	-586.7	10.56	4.95	14.84	171.53	493H POE
13,254.8	90.51	135.00	4,540.0	-4,728.6	5,025.8	0.00	0.00	0.00	0.00	493H BHL



Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 493H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6705.0usft (Original Well Elev)
Project:	San Juan Basin - Rodeo Unit	MD Reference:	KB @ 6705.0usft (Original Well Elev)
Site:	492H Pad	North Reference:	Grid
Well:	493H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
289.0	0.00	0.00	289.0	0.0	0.0	0.0	0.00	0.00	0.00
Ojo Alamo									
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
13 3/8"									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
416.0	0.00	0.00	416.0	0.0	0.0	0.0	0.00	0.00	0.00
Kirtland									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
617.0	0.51	320.44	617.0	0.1	0.0	-0.1	3.00	3.00	0.00
Fruitland									
700.0	3.00	320.44	700.0	2.0	-1.7	-2.6	3.00	3.00	0.00
800.0	6.00	320.44	799.6	8.1	-6.7	-10.4	3.00	3.00	0.00
900.0	9.00	320.44	898.8	18.1	-15.0	-23.3	3.00	3.00	0.00
968.3	11.05	320.44	966.0	27.3	-22.5	-35.1	3.00	3.00	0.00
Pictured Cliffs									
1,000.0	12.00	320.44	997.1	32.2	-26.6	-41.4	3.00	3.00	0.00
1,100.0	15.00	320.44	1,094.3	50.2	-41.4	-64.6	3.00	3.00	0.00
1,200.0	18.00	320.44	1,190.2	72.1	-59.5	-92.7	3.00	3.00	0.00
1,230.4	18.91	320.44	1,219.0	79.5	-65.7	-102.3	3.00	3.00	0.00
Lewis									
1,300.0	21.00	320.44	1,284.4	97.8	-80.8	-125.9	3.00	3.00	0.00
1,369.7	23.09	320.44	1,349.0	118.0	-97.4	-151.8	3.00	3.00	0.00
Chacra									
1,400.0	24.00	320.44	1,376.8	127.3	-105.2	-163.8	3.00	3.00	0.00
1,500.0	27.00	320.44	1,467.1	160.5	-132.6	-206.5	3.00	3.00	0.00
1,579.4	29.38	320.44	1,537.0	189.4	-156.5	-243.7	3.00	3.00	0.00
1,600.0	29.38	320.44	1,555.0	197.2	-162.9	-253.8	0.00	0.00	0.00
1,700.0	29.38	320.44	1,642.1	235.0	-194.1	-302.4	0.00	0.00	0.00
1,800.0	29.38	320.44	1,729.3	272.8	-225.4	-351.1	0.00	0.00	0.00
1,900.0	29.38	320.44	1,816.4	310.7	-256.6	-399.8	0.00	0.00	0.00
2,000.0	29.38	320.44	1,903.5	348.5	-287.9	-448.5	0.00	0.00	0.00
2,100.0	29.38	320.44	1,990.7	386.3	-319.1	-497.1	0.00	0.00	0.00
2,200.0	29.38	320.44	2,077.8	424.1	-350.4	-545.8	0.00	0.00	0.00
2,300.0	29.38	320.44	2,164.9	462.0	-381.6	-594.5	0.00	0.00	0.00
2,400.0	29.38	320.44	2,252.1	499.8	-412.9	-643.2	0.00	0.00	0.00
2,500.0	29.38	320.44	2,339.2	537.6	-444.1	-691.9	0.00	0.00	0.00
2,600.0	29.38	320.44	2,426.4	575.4	-475.4	-740.5	0.00	0.00	0.00
2,601.9	29.38	320.44	2,428.0	576.1	-475.9	-741.4	0.00	0.00	0.00
Cliff House									
2,614.5	29.38	320.44	2,439.0	580.9	-479.9	-747.6	0.00	0.00	0.00
Menefee									
2,700.0	29.38	320.44	2,513.5	613.3	-506.6	-789.2	0.00	0.00	0.00
2,800.0	29.38	320.44	2,600.6	651.1	-537.9	-837.9	0.00	0.00	0.00
2,900.0	29.38	320.44	2,687.8	688.9	-569.1	-886.6	0.00	0.00	0.00
3,000.0	29.38	320.44	2,774.9	726.7	-600.3	-935.2	0.00	0.00	0.00
3,100.0	29.38	320.44	2,862.0	764.6	-631.6	-983.9	0.00	0.00	0.00
3,200.0	29.38	320.44	2,949.2	802.4	-662.8	-1,032.6	0.00	0.00	0.00
3,300.0	29.38	320.44	3,036.3	840.2	-694.1	-1,081.3	0.00	0.00	0.00



Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 493H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6705.0usft (Original Well Elev)
Project:	San Juan Basin - Rodeo Unit	MD Reference:	KB @ 6705.0usft (Original Well Elev)
Site:	492H Pad	North Reference:	Grid
Well:	493H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)	
3,400.0	29.38	320.44	3,123.5	878.0	-725.3	-1,129.9	0.00	0.00	0.00	
3,500.0	29.38	320.44	3,210.6	915.9	-756.6	-1,178.6	0.00	0.00	0.00	
3,600.0	29.38	320.44	3,297.7	953.7	-787.8	-1,227.3	0.00	0.00	0.00	
3,700.0	29.38	320.44	3,384.9	991.5	-819.1	-1,276.0	0.00	0.00	0.00	
3,733.4	29.38	320.44	3,414.0	1,004.1	-829.5	-1,292.2	0.00	0.00	0.00	
Point Lookout										
3,800.0	29.38	320.44	3,472.0	1,029.3	-850.3	-1,324.6	0.00	0.00	0.00	
3,900.0	29.38	320.44	3,559.2	1,067.2	-881.6	-1,373.3	0.00	0.00	0.00	
3,975.6	29.38	320.44	3,625.0	1,095.7	-905.2	-1,410.1	0.00	0.00	0.00	
Mancos										
4,000.0	29.38	320.44	3,646.3	1,105.0	-912.8	-1,422.0	0.00	0.00	0.00	
4,090.3	29.38	320.44	3,725.0	1,139.1	-941.0	-1,466.0	0.00	0.00	0.00	
9 5/8"										
4,100.0	29.38	320.44	3,733.4	1,142.8	-944.1	-1,470.7	0.00	0.00	0.00	
4,119.0	29.38	320.44	3,750.0	1,150.0	-950.0	-1,479.9	0.00	0.00	0.00	
493H KOP										
4,152.4	32.80	322.10	3,778.6	1,163.5	-960.8	-1,497.0	10.56	10.25	4.96	
4,200.0	27.84	323.68	3,819.7	1,182.6	-975.3	-1,520.7	10.56	-10.43	3.33	
4,242.5	23.43	325.61	3,858.0	1,197.6	-986.0	-1,538.7	10.56	-10.38	4.54	
Gallup (MNCS_A)										
4,300.0	17.52	329.65	3,911.8	1,214.5	-996.8	-1,558.2	10.56	-10.28	7.04	
4,349.9	12.51	336.11	3,960.0	1,225.9	-1,002.8	-1,570.4	10.56	-10.03	12.93	
MNCS_B										
4,400.0	7.84	350.53	4,009.3	1,234.3	-1,005.5	-1,578.1	10.56	-9.34	28.80	
4,484.1	5.22	73.78	4,093.0	1,241.0	-1,002.8	-1,580.7	10.56	-3.11	99.00	
MNCS_Cms										
4,500.0	6.21	87.54	4,108.8	1,241.2	-1,001.2	-1,579.8	10.56	6.19	86.50	
4,600.0	15.43	118.10	4,207.0	1,235.2	-984.1	-1,563.1	10.56	9.23	30.56	
4,616.7	17.12	119.90	4,223.0	1,232.9	-980.0	-1,558.6	10.56	10.12	10.76	
MNCS_D										
4,700.0	25.70	125.38	4,300.5	1,216.3	-954.6	-1,528.7	10.56	10.30	6.59	
4,769.4	32.93	127.86	4,361.0	1,196.0	-927.4	-1,494.9	10.56	10.42	3.57	
MNCS_E										
4,800.0	36.13	128.66	4,386.2	1,185.2	-913.7	-1,477.7	10.56	10.46	2.63	
4,843.1	40.65	129.61	4,420.0	1,168.3	-893.0	-1,451.0	10.56	10.47	2.19	
MNCS_F										
4,900.0	46.62	130.62	4,461.1	1,143.0	-863.0	-1,411.8	10.56	10.49	1.78	
4,932.9	50.07	131.12	4,483.0	1,127.0	-844.4	-1,387.2	10.56	10.50	1.51	
MNCS_G										
5,000.0	57.12	131.99	4,522.8	1,091.1	-804.0	-1,333.3	10.56	10.51	1.31	
5,025.2	59.77	132.29	4,536.0	1,076.7	-788.1	-1,311.8	10.56	10.52	1.16	
MNCS_H										
5,100.0	67.64	133.07	4,569.1	1,031.3	-738.9	-1,244.8	10.56	10.52	1.05	
5,146.7	72.56	133.52	4,585.0	1,001.2	-706.9	-1,200.9	10.56	10.52	0.95	
MNCS_I										
5,200.0	78.17	134.00	4,598.5	985.5	-669.7	-1,149.4	10.56	10.53	0.90	
5,300.0	88.69	134.86	4,609.9	896.1	-598.8	-1,050.2	10.56	10.53	0.86	
5,317.2	90.51	135.00	4,610.0	883.9	-586.7	-1,033.0	10.56	10.53	0.84	
493H POE										
5,400.0	90.51	135.00	4,609.3	825.4	-528.1	-950.2	0.00	0.00	0.00	
5,500.0	90.51	135.00	4,608.4	754.7	-457.4	-850.3	0.00	0.00	0.00	
5,600.0	90.51	135.00	4,607.5	684.0	-386.7	-750.3	0.00	0.00	0.00	



Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 493H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6705.0usft (Original Well Elev)
Project:	San Juan Basin - Rodeo Unit	MD Reference:	KB @ 6705.0usft (Original Well Elev)
Site:	492H Pad	North Reference:	Grid
Well:	493H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
5,700.0	90.51	135.00	4,606.6	613.3	-316.0	-650.4	0.00	0.00	0.00
5,800.0	90.51	135.00	4,605.7	542.6	-245.3	-550.4	0.00	0.00	0.00
5,900.0	90.51	135.00	4,604.9	471.9	-174.6	-450.5	0.00	0.00	0.00
6,000.0	90.51	135.00	4,604.0	401.2	-103.9	-350.5	0.00	0.00	0.00
6,100.0	90.51	135.00	4,603.1	330.4	-33.2	-250.6	0.00	0.00	0.00
6,200.0	90.51	135.00	4,602.2	259.7	37.5	-150.6	0.00	0.00	0.00
6,300.0	90.51	135.00	4,601.3	189.0	108.2	-50.7	0.00	0.00	0.00
6,400.0	90.51	135.00	4,600.5	118.3	179.0	49.3	0.00	0.00	0.00
6,500.0	90.51	135.00	4,599.6	47.6	249.7	149.2	0.00	0.00	0.00
6,600.0	90.51	135.00	4,598.7	-23.1	320.4	249.2	0.00	0.00	0.00
6,700.0	90.51	135.00	4,597.8	-93.8	391.1	349.1	0.00	0.00	0.00
6,800.0	90.51	135.00	4,596.9	-164.5	461.8	449.1	0.00	0.00	0.00
6,900.0	90.51	135.00	4,596.0	-235.2	532.5	549.0	0.00	0.00	0.00
7,000.0	90.51	135.00	4,595.2	-305.9	603.2	649.0	0.00	0.00	0.00
7,100.0	90.51	135.00	4,594.3	-376.6	673.9	748.9	0.00	0.00	0.00
7,200.0	90.51	135.00	4,593.4	-447.3	744.6	848.9	0.00	0.00	0.00
7,300.0	90.51	135.00	4,592.5	-518.1	815.3	948.8	0.00	0.00	0.00
7,400.0	90.51	135.00	4,591.6	-588.8	886.0	1,048.8	0.00	0.00	0.00
7,500.0	90.51	135.00	4,590.8	-659.5	956.7	1,148.7	0.00	0.00	0.00
7,600.0	90.51	135.00	4,589.9	-730.2	1,027.4	1,248.7	0.00	0.00	0.00
7,700.0	90.51	135.00	4,589.0	-800.9	1,098.1	1,348.6	0.00	0.00	0.00
7,800.0	90.51	135.00	4,588.1	-871.6	1,168.9	1,448.6	0.00	0.00	0.00
7,900.0	90.51	135.00	4,587.2	-942.3	1,239.6	1,548.5	0.00	0.00	0.00
8,000.0	90.51	135.00	4,586.3	-1,013.0	1,310.3	1,648.5	0.00	0.00	0.00
8,100.0	90.51	135.00	4,585.5	-1,083.7	1,381.0	1,748.4	0.00	0.00	0.00
8,200.0	90.51	135.00	4,584.6	-1,154.4	1,451.7	1,848.4	0.00	0.00	0.00
8,300.0	90.51	135.00	4,583.7	-1,225.1	1,522.4	1,948.3	0.00	0.00	0.00
8,400.0	90.51	135.00	4,582.8	-1,295.8	1,593.1	2,048.2	0.00	0.00	0.00
8,500.0	90.51	135.00	4,581.9	-1,366.6	1,663.8	2,148.2	0.00	0.00	0.00
8,600.0	90.51	135.00	4,581.0	-1,437.3	1,734.5	2,248.1	0.00	0.00	0.00
8,700.0	90.51	135.00	4,580.2	-1,508.0	1,805.2	2,348.1	0.00	0.00	0.00
8,800.0	90.51	135.00	4,579.3	-1,578.7	1,875.9	2,448.0	0.00	0.00	0.00
8,900.0	90.51	135.00	4,578.4	-1,649.4	1,946.6	2,548.0	0.00	0.00	0.00
9,000.0	90.51	135.00	4,577.5	-1,720.1	2,017.3	2,647.9	0.00	0.00	0.00
9,100.0	90.51	135.00	4,576.6	-1,790.8	2,088.1	2,747.9	0.00	0.00	0.00
9,200.0	90.51	135.00	4,575.8	-1,861.5	2,158.8	2,847.8	0.00	0.00	0.00
9,300.0	90.51	135.00	4,574.9	-1,932.2	2,229.5	2,947.8	0.00	0.00	0.00
9,400.0	90.51	135.00	4,574.0	-2,002.9	2,300.2	3,047.7	0.00	0.00	0.00
9,500.0	90.51	135.00	4,573.1	-2,073.6	2,370.9	3,147.7	0.00	0.00	0.00
9,600.0	90.51	135.00	4,572.2	-2,144.3	2,441.6	3,247.6	0.00	0.00	0.00
9,700.0	90.51	135.00	4,571.3	-2,215.1	2,512.3	3,347.6	0.00	0.00	0.00
9,800.0	90.51	135.00	4,570.5	-2,285.8	2,583.0	3,447.5	0.00	0.00	0.00
9,900.0	90.51	135.00	4,569.6	-2,356.5	2,653.7	3,547.5	0.00	0.00	0.00
10,000.0	90.51	135.00	4,568.7	-2,427.2	2,724.4	3,647.4	0.00	0.00	0.00
10,100.0	90.51	135.00	4,567.8	-2,497.9	2,795.1	3,747.4	0.00	0.00	0.00
10,200.0	90.51	135.00	4,566.9	-2,568.6	2,865.8	3,847.3	0.00	0.00	0.00
10,300.0	90.51	135.00	4,566.1	-2,639.3	2,936.5	3,947.3	0.00	0.00	0.00
10,400.0	90.51	135.00	4,565.2	-2,710.0	3,007.3	4,047.2	0.00	0.00	0.00
10,500.0	90.51	135.00	4,564.3	-2,780.7	3,078.0	4,147.2	0.00	0.00	0.00
10,600.0	90.51	135.00	4,563.4	-2,851.4	3,148.7	4,247.1	0.00	0.00	0.00
10,700.0	90.51	135.00	4,562.5	-2,922.1	3,219.4	4,347.1	0.00	0.00	0.00
10,800.0	90.51	135.00	4,561.6	-2,992.8	3,290.1	4,447.0	0.00	0.00	0.00
10,900.0	90.51	135.00	4,560.8	-3,063.6	3,360.8	4,547.0	0.00	0.00	0.00
11,000.0	90.51	135.00	4,559.9	-3,134.3	3,431.5	4,646.9	0.00	0.00	0.00



Planning Report

Database: EDM
Company: Enduring Resources LLC
Project: San Juan Basin - Rodeo Unit
Site: 492H Pad
Well: 493H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 493H
TVD Reference: KB @ 6705.0usft (Original Well Elev)
MD Reference: KB @ 6705.0usft (Original Well Elev)
North Reference: Grid
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)
11,100.0	90.51	135.00	4,559.0	-3,205.0	3,502.2	4,746.9	0.00	0.00	0.00
11,200.0	90.51	135.00	4,558.1	-3,275.7	3,572.9	4,846.8	0.00	0.00	0.00
11,300.0	90.51	135.00	4,557.2	-3,346.4	3,643.6	4,946.8	0.00	0.00	0.00
11,400.0	90.51	135.00	4,556.4	-3,417.1	3,714.3	5,046.7	0.00	0.00	0.00
11,500.0	90.51	135.00	4,555.5	-3,487.8	3,785.0	5,146.7	0.00	0.00	0.00
11,600.0	90.51	135.00	4,554.6	-3,558.5	3,855.7	5,246.6	0.00	0.00	0.00
11,700.0	90.51	135.00	4,553.7	-3,629.2	3,926.5	5,346.6	0.00	0.00	0.00
11,800.0	90.51	135.00	4,552.8	-3,699.9	3,997.2	5,446.5	0.00	0.00	0.00
11,900.0	90.51	135.00	4,551.9	-3,770.6	4,067.9	5,546.5	0.00	0.00	0.00
12,000.0	90.51	135.00	4,551.1	-3,841.3	4,138.6	5,646.4	0.00	0.00	0.00
12,100.0	90.51	135.00	4,550.2	-3,912.1	4,209.3	5,746.4	0.00	0.00	0.00
12,200.0	90.51	135.00	4,549.3	-3,982.8	4,280.0	5,846.3	0.00	0.00	0.00
12,300.0	90.51	135.00	4,548.4	-4,053.5	4,350.7	5,946.3	0.00	0.00	0.00
12,400.0	90.51	135.00	4,547.5	-4,124.2	4,421.4	6,046.2	0.00	0.00	0.00
12,500.0	90.51	135.00	4,546.7	-4,194.9	4,492.1	6,146.2	0.00	0.00	0.00
12,600.0	90.51	135.00	4,545.8	-4,265.6	4,562.8	6,246.1	0.00	0.00	0.00
12,700.0	90.51	135.00	4,544.9	-4,336.3	4,633.5	6,346.1	0.00	0.00	0.00
12,800.0	90.51	135.00	4,544.0	-4,407.0	4,704.2	6,446.0	0.00	0.00	0.00
12,900.0	90.51	135.00	4,543.1	-4,477.7	4,774.9	6,546.0	0.00	0.00	0.00
13,000.0	90.51	135.00	4,542.2	-4,548.4	4,845.7	6,645.9	0.00	0.00	0.00
13,100.0	90.51	135.00	4,541.4	-4,619.1	4,916.4	6,745.9	0.00	0.00	0.00
13,200.0	90.51	135.00	4,540.5	-4,689.8	4,987.1	6,845.8	0.00	0.00	0.00
13,254.8	90.51	135.00	4,540.0	-4,728.6	5,025.8	6,900.6	0.00	0.00	0.00

493H BHL

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
493H KOP - plan hits target center - Point	0.00	0.00	3,750.0	1,150.0	-950.0	1,889,627.99	2,753,101.76	36.193173°N	107.731627°W
493H BHL - plan hits target center - Point	0.00	0.00	4,540.0	-4,728.6	5,025.8	1,883,749.43	2,759,077.54	36.177005°N	107.711399°W
493H POE - plan hits target center - Point	0.00	0.00	4,610.0	883.9	-586.7	1,889,361.93	2,753,465.09	36.192441°N	107.730396°W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
350.0	350.0	13 3/8"	13-3/8	17-1/2
4,090.3	3,725.0	9 5/8"	9-5/8	12-1/4



Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 493H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6705.0usft (Original Well Elev)
Project:	San Juan Basin - Rodeo Unit	MD Reference:	KB @ 6705.0usft (Original Well Elev)
Site:	492H Pad	North Reference:	Grid
Well:	493H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
289.0	289.0	Ojo Alamo		0.00	
416.0	416.0	Kirtland		0.00	
617.0	617.0	Fruitland		0.00	
968.3	968.0	Pictured Cliffs		0.00	
1,230.4	1,219.0	Lewis		0.00	
1,369.7	1,349.0	Chacra		0.00	
2,601.9	2,428.0	Cliff House		0.00	
2,614.5	2,439.0	Menefee		0.00	
3,733.4	3,414.0	Point Lookout		0.00	
3,975.6	3,625.0	Mancos		0.00	
4,242.5	3,858.0	Gallup (MNCS_A)		0.00	
4,349.9	3,960.0	MNCS_B		0.00	
4,484.1	4,093.0	MNCS_Cms		0.00	
4,616.7	4,223.0	MNCS_D		0.00	
4,769.4	4,361.0	MNCS_E		0.00	
4,843.1	4,420.0	MNCS_F		0.00	
4,932.9	4,483.0	MNCS_G		0.00	
5,025.2	4,536.0	MNCS_H		0.00	
5,146.7	4,585.0	MNCS_I		0.00	



Enduring Resources LLC

Directional Drilling Plan
Plan View & Section View

Rodeo Unit 493H

San Juan County, New Mexico

T23N-R08W-Sec.31-Lot D

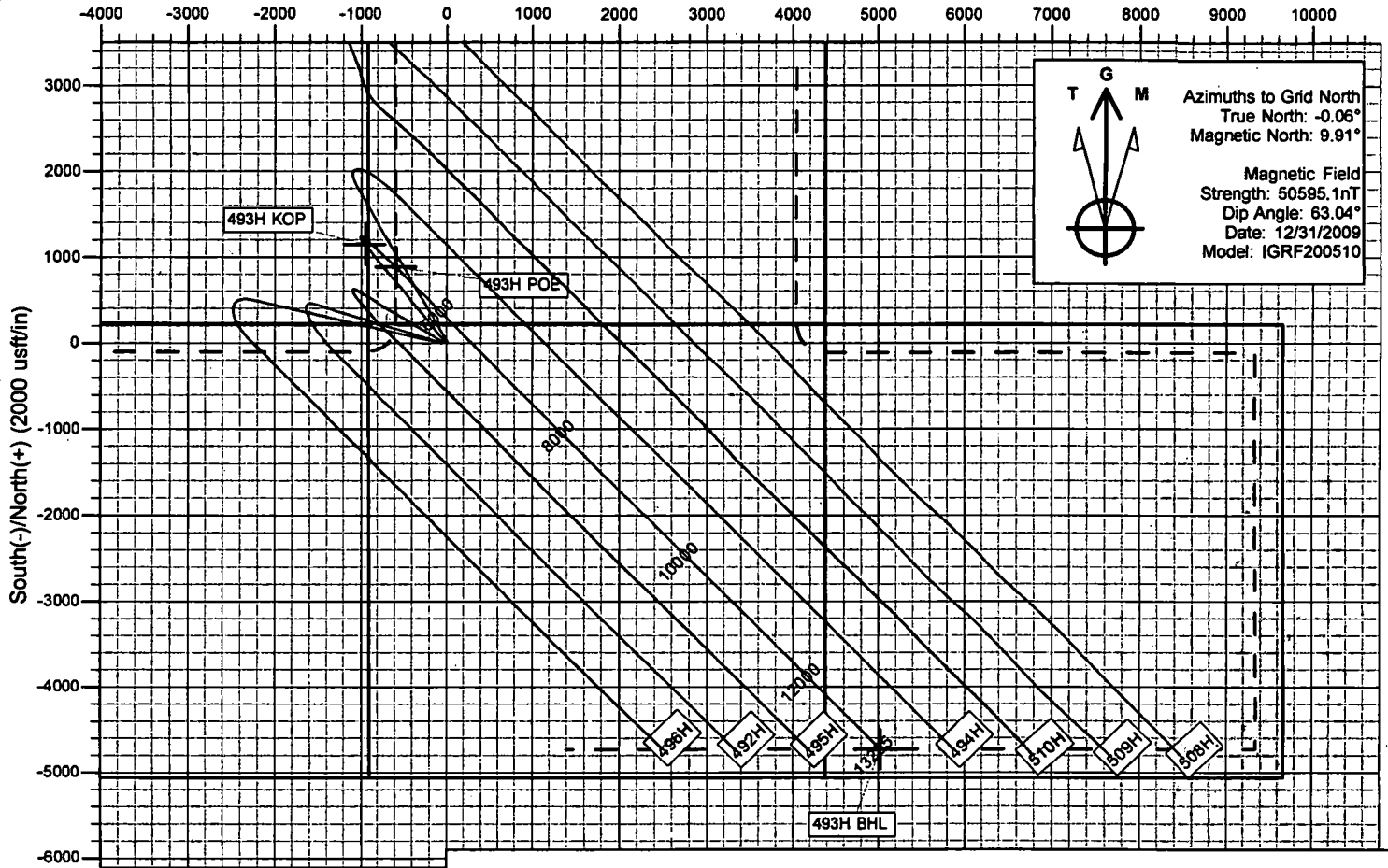
Surface Latitude: 36.190011°N

Surface Longitude: 107.728411°W

Ground Level: 6680.0

Reference Elevation: KB @ 6705.0usft (Original Well Elev)

West(-)/East(+) (2000 usft/in)



Design Target Details

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
493H KOP	3750.0	1150.0	-950.0	1889627.99	2753101.76	36.193173°N	107.731626°W
493H BHL	4540.0	-4728.6	5025.8	1883749.43	2759077.54	36.177005°N	107.711399°W
493H POE	4610.0	883.9	-586.7	1889361.93	2753465.09	36.192441°N	107.730396°W

Directional Drilling Plan Details

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Vsect
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.0
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.0
1578.4	29.38	320.44	1537.0	189.4	-156.5	3.00	-2

WELL NAME: RODEO UNIT 493H**OBJECTIVE:** Drill, complete, and equip single lateral in the Mancos-I formation**API Number:** 30-045-35724**State:** New Mexico**County:** San Juan**Surface Elev.:** 6,680 ft ASL (GL) 6,705 ft ASL (KB)**Surface Location:** 31-23N-08W Sec-Twn- Rng 225 ft FNL 915 ft FWL**BH Location:** 32-23N-08W Sec-Twn- Rng 330 ft FSL 649 ft FWL

Driving Directions: FROM THE INTERSECTION OF US HWY 550 & US HWY 64 IN BLOOMFIELD, NM: South on US Hwy 550 for 38.7 miles to MM 112.7; Right (South) on CR 7900 for 2.3 miles to fork; Right (West) on 7940 for 2.6 miles, Right (North-West) on new acces road for approximately 0.2 miles to Rodeo Unit 492H Pad (includes wells 492H, 493H, 494H, 495H, 496H).

QUICK REFERENCE

Sur TD (MD)	350 ft
Int TD (MD)	4,090 ft
KOP (MD)	4,119 ft
KOP (TVD)	3,750 ft
Target (TVD)	4,610 ft
Curve BUR	10 °/100 ft
POE (MD)	5,317 ft
TD (MD)	13,255 ft
Lat Len (ft)	7,938 ft

WELL CONSTRUCTION SUMMARY:

	Hole (in)	TD MD (ft)	Csg (in)	Csg (lb/ft)	Csg (grade)	Csg (conn)	Csg Top (ft)	Csg Bot (ft)
Surface	17.500	350	13.375	54.5	J-55	BTC	0	350
Intermediate	12.250	4,090	9.625	36.0	J-55	LTC	0	4,090
Production	8.500	13,255	5.500	17.0	P-110	LTC	0	13,255

CEMENT PROPERTIES SUMMARY:

	Type	Wt (ppg)	Yd (cuft/sk)	Wtr (gal/sk)	Hole Cap. (cuft/ft)	% Excess	TOC (ft MD)	Total (sx)
Surface	Class G	15.8	1.174	5.15	0.6946	100%	0	414
Inter. (Lead)	G:POZ Blend	12.3	1.987	10.16	0.3627	40%	0	804
Inter. (Tail)	Class G	15.8	1.148	4.98	0.3132	10%	3,590	150
Prod. (Lead)	G:POZ blend	12.4	1.907	9.98	0.2691	40%	0	834
Prod. (Tail)	G:POZ blend	13.3	1.360	6.00	0.2291	10%	4,243	1,670

COMPLETION / PRODUCTION SUMMARY:**Frac:** 45-stage (+/-) plug-and-perf frac with slick water and 15,000,000 lbs (+/-) proppant**Flowback:** Flow up production tubing as pressures allow (an ESP may be used to assist in load-water recovery)**Production:** 2-7/8" tubing, ESP will be replaced with gas lift as well conditions dictate