

GEOLOGIC & DRILLING PROGNOSIS

Prepared: 30-Dec-25 CMW

WELL NAME: FEDERAL RGU 442-6-297
Directional from the pad RGU 23-6-297

API: 05-103-12654
STATE: CO
COUNTY: RIO BLANCO
SURFACE HOLE LOCATION: Sec. 6 T 2S R 97W
TYPE OF UNIT: FED
FEDERAL EA: Yes
HARDLINE: No

ELEVATION (ft):
PAD (ft): 6222
GROUND (ft): 6222
KELLY BUSHING (ft): 6252

RIG INFORMATION:
RIG NAME: HP 522
KB HEIGHT (ft): 30

ESTIMATE TOPS:

Formation	TVD	MD	Formation Resource Notes
Uinta	30	30	Potentially Useable Water
Green River	650	653	Potentially Useable Water
A Groove	800	807	Potentially Useable Water
B Groove	1000	1014	Potentially Useable Water
Dissolution Surface	1300	1331	Possible Lost Circ Zone
Garden Gulch	2200	2281	Potentially Useable Water
Orange Marker	2266	2449	Potentially Useable Water
Upper Wasatch	2440	2534	Potentially Useable Water
Top of "G" Sand	5050	5288	Possible Lost Circ Zone
Fort Union	5310	5562	Gas and Limited Use and Quality Water
Lower Wasatch	6100	6396	Potentially Useable Water
Ohio Creek	6992	7337	Possible Lost Circ Zone
Upper Measaverde	7712	8089	Gas and Limited Use and Quality Water
Approx. Top Gas	8512	8895	Gas and Limited Use and Quality Water
Cameo Coals	10082	10465	Gas, Coal, and Limited Use and Quality Water
Rollins SS	10812	11195	Gas and Limited Use and Quality Water
Cozzette	10962	11345	Gas and Limited Use and Quality Water
Corcoran	11287	11670	Gas and Limited Use and Quality Water
Upper Segoe	11547	11930	Gas and Limited Use and Quality Water
Lower Segoe	11792	12175	Gas and Limited Use and Quality Water
TD	12292	12675	

MUD LOGGING: Type: (Optional) Remote Gas Unit
Interval: Base of surface casing to TD with total gas only

OPEN HOLE LOGS: Specifics: (Optional) Triple-Combo (DIL-GR-SP-Neutron Density)
Interval: (Optional) GR from TD to surface, DIL-SP and Neutron Density from TD to 100' inside surface casing

CASED HOLE LOGS: Cement Eval: CBL

CSG & CEMENT PROGRAM: SHOE TEST REQUIRED

	Csg Size (in)	Depth Set (tvd)	Depth Set (md)	Hole Size (in)	Approx. Cmt Tail (ft3)	Tail Yield (ft3/sx)	Approx. Sx Tail	Approx. Cmt Lead (ft3)	Lead Yield (ft3/sx)	Approx. Sx Lead	WOC (hrs)
Conductor:	20	80	80	30	230	1.15					
Surface:	9.625	2540	2639	12.25	188	1.68	112	871	2.53	344	
Liner or Production:	4.5	12292	12675	8.75	1685	1.88	896	1033	2.09	494	
							Surface (sacks):	456	Prod. (sacks):	1390	

ANTICIPATED PRESSURES (psi)

MASP	Prod Csg Test Pressure	Anticipated BHP	Prod. Csg. Grade
3,688	8,500	5,716	HCP-110

MUD PROGRAM: (Do not deviate from mud engineer's recommendation without prior consent from Parachute office)

FROM (md)	TO (md)	TYPE MUD	#/GAL	VIS	WL	CHEMICALS
0	2639	WBM	8.3-9.5	45-50	7-15	Bentonite/PHPA
2639	12675	LSND	8.6-10.0	40-80	6-10	PHPA/Barite

(Write mud added to system on tour sheets and report all mud mixed and daily cost in morning report)

LOST CIRCULATION: Report depth and bbls of mud lost on morning report and tour sheet. Any severe lost circulation problems should be reported immediately to well supervisor.

SURVEYS: Run every 100' on surface hole and trips unless otherwise instructed.

TEP GEOLOGIST: Office: 281-936-0361 Cell: 303-918-4327
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(note: if there are questions concerning TD or logging, please call Geologist)

CASING & CEMENTING PLAN

Operator: TEP Rocky Mountain
 Well Name & Number: FEDERAL RGU 442-6-297
 Location: Ryan Gulch

Casing Design Calculations											
Type of Casing	Size of Hole (inches)	Size of Casing (inches)	Weight per Foot (lbs/ft)	Grade	Thread	Interval (ft - ft)	Length (feet)	Setting Depth (TVD feet)	Collapse (psi)	Burst (psi)	Tension (lbs)
Surface	12.25	9.625	36.0	J-55	BTC	0-2639	2,639	2,540	2,020	3,520	453,000
Production	8.75	4.500	11.6	HCP-110	GB (BTC)	0-12675	12,675	12,292	8,650	10,690	367,000

Surface Casing Shoe	Production Casing Shoe
Max MW = 9.5 ppg HP = 1,255 psi	Max MW = 10.0 ppg HP = 6,392 psi

True Vertical Depth = 12,292 ft
 Bottom Hole Pressure = 5,716 psi
 Pore Pressure Gradient = 0.465 psi/ft
 Max. Sur. Pressure = 3,688 psi
 BOP Required = 5M System

Bottom Hole Temperature = 260 degrees Fahrenheit

Casing Safety Factors			
Surface Casing	Pb = 1.17	Min = 1.100	Pass
	Pc = 1.61	Min = 1.125	Pass
	Sj = 4.77	Min = 1.500	Pass
Production Casing	Pb = 3.55	Min = 1.100	Pass
	Pc = 1.35	Min = 1.125	Pass
	Sj = 2.50	Min = 1.500	Pass

Cement Design Calculations

Critical Depths - Permitting Purposes Only	
Casing/Formation	Measured Depth
Surface Casing	2,639 ft
Top of "G" Sand	5,288 ft
Top of Mesaverde	8,089 ft
Top of Gas	8,895 ft
Total Depth	12,675 ft

Surface Cement	Stg II Lead	Stg I Lead	Tail
Top of Cement (ft)	0	0	2,139
Bottom of Cement (ft)	0	2,139	2,639
Cement Type	Type II	Type II	Class G
Additives (lb/sk)	.25 IntegraSeal	.25 IntegraSeal	.25 IntegraSeal
Volume, bbls	0	119	28
Annular vol w/ excess, ft ³	0	871	188
Volume (sks)	0	344	112
Slurry Density (ppg)	12.3	12.3	13.9
Slurry Yield (ft ³ /sk)	2.530	2.530	1.680
Mixwater (gal/sk)	14.80	14.80	8.27
Annular Capacity (BBL)	0.0558	0.0558	0.0558
Annular Capacity (CF)	0.3132	0.3132	0.3132
Excess (%)	0.30	0.30	0.20
Total Sacks =			456
Total Cubic Ft. =			1,059

Production Cement	Lead	Tail
Top of Cement (ft)	5088	7889
Bottom of Cement (ft)	7889	12675
Cement Type	Type II	Class G
Additives (lb/sk)	.25 IntegraSeal	35% Silica
Volume, bbls	184	300
Annular vol w/excess, ft ³	1,033	1685
Volume (sks)	494	896
Slurry Density (ppg)	12.7	13.5
Slurry Yield (ft ³ /sk)	2.090	1.880
Mixwater (gal/sk)	11,200	9,100
Annular Capacity (BBL)	0.0547	0.0547
Annular Capacity (CF)	0.3072	0.3072
Excess (%)	0.20	0.10
Total Sacks =		1,390
Total Cubic Ft. =		2,717

NOTES:

Surface

Single track guide shoe and float collar. Bowspring Centralize 1st, 2nd, & 3rd jt. & every 4th joint.
 WOC prior to drill out for a minimum of 500 psi compressive.

Production

Reamer/Guide Shoe, 1jt blank, and Single Valve FC. Spiralizer Centralize 1st, 2nd, 3rd, 6th and 8th. 10' short jt above Ohio Creek
 5 Spiralizers every other joint above drop/TOG From 8895 to 8395

All Casing strings will be tested to .22psi/ft, or 1500 psi, whichever is greater, but will not exceed 70% of the minimum internal yield. If pressure declines more than 10% in 30 minutes, notification will be made and corrective actions will be taken.

Casing Design Calculations

<p>Surface Casing - 36#</p>	<p>Burst Bottom Hole Pressure = TVD * Pore Pressure Gradient = 12292 * 0.465 RG 312-24-298 5715.8 psi RGU 23-6-297 Pburst = Bottom Hole Pressure - (0.22 * TVD) = 5715.78 - (0.22 * 12292) = 3011.5 psi Pb = Casing Burst Rating / Pburst = 3520 / 3011.54 = 1.17 Pb ≥ 1.1 1.17 ≥ 1.1</p> <hr/> <p>Collapse If: Max MW * Setting TVD * 0.052 ≥ Pore Pressure Gradient * Setting TVD 9.5 * 2540 * 0.052 ≥ 0.465 * 2540 1254.8 ≥ 1181.1 Pcollapse = Max MW * Setting TVD * 0.052 = 1254.8 psi Else: Pcollapse = Pore Pressure Gradient * Setting TVD = 1181.1 psi Pcollapse = 1254.8 psi Pc = Casing Collapse Rating / Pcollapse = 2020 / 1254.76 = 1.61 Pc ≥ 1.125 1.61 ≥ 1.125</p> <hr/> <p>Tensile Tension = (Weight1 * Length1) = (36 * 2639) = 95004 lbs Sj = Casing Tension Rating / Tension = 453000 / 95004 = 4.77 Sj ≥ 1.5 4.77 ≥ 1.5</p>
<p>Production Casing</p>	<p>Burst Bottom Hole Pressure = TVD * Pore Pressure Gradient = 12292 * 0.465 = 5715.8 psi Pburst = Bottom Hole Pressure - (0.22 * TVD) = 5715.78 - (0.22 * 12292) = 3011.5 psi Pburst = MATP = 8,500 psi Pburstmax = 8,500 psi Pb = Casing Burst Rating / Pburst max = 10690 / 8500 = 1.26 Pb ≥ 1.1 1.26 ≥ 1.1</p> <hr/> <p>Collapse If: Max MW * Setting TVD * 0.052 ≥ Pore Pressure Gradient * Setting TVD 10 * 12292 * 0.052 ≥ 0.465 * 12292 6391.8 ≥ 5715.78 Pcollapse = Max MW * Setting TVD * 0.052 = 6391.8 psi Else: Pcollapse = Pore Pressure Gradient * Setting TVD = 5715.8 psi Pcollapse = 6391.8 psi Pc = Casing Collapse Rating / Pcollapse = 8650 / 6391.84 = 1.35 Pc ≥ 1.125 1.35 ≥ 1.125</p> <hr/> <p>Tensile Tension = Weight * Length = 11.6 * 12675 = 147030 lbs Sj = Casing Tension Rating / Tension = 367000 / 147030 = 2.50 Sj ≥ 1.5 2.50 ≥ 1.5</p>