GEOLOGIC & DRILLING PROGNOSIS

Prepared: 30-Dec-25 CMW

WELL NAME: **FEDERAL RGU 341-6-297**
Directional from the pad RGU 23-6-297

API: 05-103-12650
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	**652**	Potentially Useable Water
A Groove	800	**804**	Potentially Useable Water
B Groove	1000	**1009**	Potentially Useable Water
Dissolution Surface	1300	**1326**	Possible Lost Circ Zone
Garden Gulch	2200	**2321**	Potentially Useable Water
Orange Marker	2226	**2499**	Potentially Useable Water
Upper Wasatch	2440	**2588**	Potentially Useable Water
Top of "G" Sand	5050	**5485**	Possible Lost Circ Zone
Fort Union	5310	**5774**	Gas and Limited Use and Quality Water
Lower Wasatch	6100	**6651**	Potentially Useable Water
Ohio Creek	7032	**7684**	Possible Lost Circ Zone
Upper Measaverde	7752	**8441**	Gas and Limited Use and Quality Water
Approx. Top Gas	8552	**9247**	Gas and Limited Use and Quality Water
Cameo Coals	10122	**10817**	Gas, Coal, and Limited Use and Quality Water
Rollins SS	10852	**11547**	Gas and Limited Use and Quality Water
Cozzette	11002	**11697**	Gas and Limited Use and Quality Water
Corcoran	11327	**12022**	Gas and Limited Use and Quality Water
Upper Sego	11587	**12282**	Gas and Limited Use and Quality Water
Lower Sego	11832	**12527**	Gas and Limited Use and Quality Water
TD	12332	**13027**	

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	2699	12.25	188	1.68	112	895	2.53	354	
Liner or Production:	4.5	12332	13027	8.75	1684	1.88	896	1090	2.09	521	
							Surface (sacks):	466	**Prod. (sacks):**	1417	

ANTICIPATED PRESSURES (psi)

MASP	Prod Csg Test Pressure	Anticipated BHP	Prod. Csg. Grade
3,700	8,500	5,734	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	2699	WBM	8.3-9.5	45-50	7-15	Bentonite/PHPA
2699	13027	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** **Cell**
Stephen Sunnenberg **281-936-0361** **303-918-4327** stephen.sunnenberg@flywheelenergy.com
(note: if there are questions concerning TD or logging, please call Geologist)

CASING & CEMENTING PLAN

Operator: TEP Rocky Mountain
Well Name & Number: FEDERAL RGU 341-6-297
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	0-2699	2,699	2,540	2,020	3,520	453,000
Production	8.75	4.500	11.6	HCP-110	GB (BTC)	0-13027	13,027	12,332	8,650	10,690	367,000

	Surface Casing Shoe		Production Casing Shoe	
Max MW =	9.5	ppg	10.0	ppg
HP =	1,255	psi	6,413	psi

True Vertical Depth =	12,332	ft
Bottom Hole Pressure =	5,734	psi
Pore Pressure Gradient =	0.465	psi/ft
Max. Sur. Pressure =	3,700	psi
BOP Required =	5M	System

Bottom Hole Temperature = 260 degrees Farenheit

Casing Safety Factors			
Surface Casing	Pb = 1.17	Min = 1.100	Pass
	Pc = 1.61	Min = 1.125	Pass
	Sj = 4.66	Min = 1.500	Pass
Production Casing	Pb = 3.54	Min = 1.100	Pass
	Pc = 1.35	Min = 1.125	Pass
	Sj = 2.43	Min = 1.500	Pass

Cement Design Calculations

Critical Depths - Permitting Purposes Only	
Casing/Formation	Measured Depth
Surface Casing	2,699 ft
Top of "G" Sand	5,485 ft
Top of Mesaverde	8,441 ft
Top of Gas	9,247 ft
Total Depth	13,027 ft

Surface Cement	Stg II Lead	Stg I Lead	Tail
Top of Cement (ft)	0	0	2,199
Bottom of Cement (ft)	0	2,199	2,699
Cement Type	Type IL	Type IL	Class G
Additives (lb/sk)	.25 IntegraSeal	.25 IntegraSeal	.25 IntegraSeal
Volume, bbls	0	123	28
Annular vol w/ excess, ft^3	0	895	188
Volume (sks)	0	354	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 =		466
	Total Cubic Ft. =		1,083

Production Cement	Lead	Tail
Top of Cement (ft)	5285	8241
Bottom of Cement (ft)	8241	13027
Cement Type	Type IL	Class G
Additives (lb/sk)	.25 IntegraSeal	35% Silica
Volume, bbls	194	300
Annular vol w/excess, ft^3	1,090	1684
Volume (sks)	521	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 =	1,417	
Total Cubic Ft. =	2,774	

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 9247 to 8747

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

Surface Casing - 36#

Burst

Bottom Hole Pressure = TVD * Pore Pressure Gradient
= 12332 * 0.465
RG 312-24-298 5734.4 psi
RGU 23-6-297
Pburst = Bottom Hole Presure - (0.22 * TVD)
= 5734.38 - (0.22 * 12332)
= 3021.3 psi

Pb = Casing Burst Rating / Pburst
= 3520 / 3021.34
= 1.17

Pb ≥ 1.1
1.17 ≥ 1.1

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

Tensile

Tension = (Weight1 * Length1)
= (36 * 2699)
= 97164 lbs

Sj = Casing Tension Rating / Tension
= 453000 / 97164
= 4.66

Sj ≥ 1.5
4.66 ≥ 1.5

Production Casing

Burst

Bottom Hole Pressure = TVD * Pore Pressure Gradient
= 12332 * 0.465
= 5734.4 psi

Pburst = Bottom Hole Presure - (0.22 * TVD)
= 5734.38 - (0.22 * 12332)
= 3021.3 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

Collapse

If: Max MW * Setting TVD * 0.052 ≥ Pore Pressure Gradient * Setting TVD
10 * 12332 * 0.052 ≥ 0.465 * 12332
6412.6 ≥ 5734.38

Pcollapse = Max MW * Setting TVD *0.052
= 6412.6 psi

Else:
Pcollapse = Pore Pressure Gradient * Setting TVD
= 5734.4 psi

Pcollapse= 6412.6 psi
Pc = Casing Collapse Rating / Pcollapse
= 8650 / 6412.64
= 1.35

Pc ≥ 1.125
1.35 ≥ 1.125

Tensile

Tension = Weight * Length
= 11.6 * 13027
= 151113 lbs

Sj = Casing Tension Rating / Tension
= 367000 / 151113.2
= 2.43

Sj ≥ 1.5
2.43 ≥ 1.5