



WELL STIMULATION REPORT

Bayswater Exploration

Ruby West 4

05-123-51757-00

March 09, 2023

HALLIBURTON

Production
Enhancement

Engineering Executive Summary

On Tuesday, December 06, 2022 the stimulation of treatment(s) was performed in the Niobrara formation on the Ruby West 4 well in WELD county, COLORADO.

The proposed treatment(s) consisted of:

24,000	gallons of	15% HCl
0	gallons of	3ppt HVFR(FightR EC-4M)
21,629,630	gallons of	HVFR (FightR EC-4M)
0	gallons of	Pump Down
23,500	gallons of	Treated Water
1,339,200	pounds of	100 Mesh Premium White
15,872,100	pounds of	30/50 Premium White
691,200	pounds of	40/70 Premium White
0	pounds of	SS-200 Premium White

The actual treatment(s) consisted of:

7,489	gallons of	15% HCl
21,428,628	gallons of	3ppt HVFR(FightR EC-4M)
0	gallons of	HVFR (FightR EC-4M)
617,694	gallons of	Pump Down
578,253	gallons of	Treated Water
1,339,205	pounds of	100 Mesh Premium White
14,751,230	pounds of	30/50 Premium White
693,690	pounds of	40/70 Premium White
0	pounds of	SS-200 Premium White

39 of 47 treatment(s) were fully completed. 0 treatment(s) were skipped, and 8 treatment(s) were screened out or otherwise cut short of design.

The well was first opened Tuesday, December 06, 2022 at 16:14 with an opening pressure of 1,730.0 psi.

The total amount of proppant pumped was 16,784,125.0 lbm with an average concentration of 0.75 ppg and maximum concentration of 2.0 ppg. Treating pressure averaged 7007.42 psi and rate averaged 75.58 bpm.

The operation came offline at 04:14 and the well was shut in Monday, January 02, 2023 at 04:29 with a final shut-in pressure of 4,367.0 psi. A more detailed description of the actual treatment can be found further down in this report.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well.

Regards,

Thomas Nowak

Chad Lewis

Crew Service Leader

Crew Lead Engineer

WELL COMPLETION DATA

Treatment Interval	Perforation Top (ft)	Perforation Bottom (ft)	Plug Depth (ft)	Vertical Depth (ft)	Perforation Count	Cluster Count	Cluster Spacing	Perforation Phasing	SalesOrder Number
1	17836	17841	17846	7230	22	9	200	120	908283159
2	17624	17798	17803	7230	22	9	200	120	908283159
3	17424	17598	17603	7230	22	9	200	120	908283159
4	17224	17398	17403	7230	22	9	200	120	908283159
5	17024	17198	17203	7226	22	9	200	120	908283159
6	16824	16998	17003	7225	22	9	200	120	908283159
7	16624	16798	16803	7225	22	9	200	120	908283159
8	16424	16598	16603	7225	22	9	200	120	908283159
9	16224	16398	16403	7226	22	9	200	120	908283159
10	16024	16198	16203	7226	22	9	200	120	908283159
11	15824	15998	16003	7227	22	9	200	120	908283159
12	15624	15798	15803	7227	22	9	200	120	908283159
13	15424	15598	15603	7228	22	9	200	120	908283159
14	15224	15398	15403	7228	22	9	200	120	908283159
15	15024	15198	15203	7226	22	9	200	120	908283159
16	14824	14998	15003	7223	22	9	200	120	908283159
17	14624	14798	14803	7219	22	9	200	120	908283159
18	14424	14598	14603	7217	22	9	200	120	908283159
19	14224	14398	14403	7215	22	9	200	120	908283159
20	14024	14198	14203	7212	22	9	200	120	908283159
21	13824	13998	14003	7209	22	9	200	120	908283159
22	13624	13798	13803	7205	22	9	200	120	908283159

WELL COMPLETION DATA

Treatment Interval	Perforation Top (ft)	Perforation Bottom (ft)	Plug Depth (ft)	Vertical Depth (ft)	Perforation Count	Cluster Count	Cluster Spacing	Perforation Phasing	SalesOrder Number
23	13424	13598	13603	7202	22	9	200	120	908283159
24	12824	13398	13403	7197	22	9	200	120	908283159
25	12624	12798	12803	7194	22	9	200	120	908283159
26	12424	12598	12603	7194	22	9	200	120	908283159
27	12224	12398	12403	7194	22	9	200	120	908283159
28	12024	12198	12203	7195	22	9	200	120	908283159
29	11824	11998	12003	7196	22	9	200	120	908283159
30	11624	11798	11803	7197	22	9	200	120	908283159
31	11424	11598	11603	7197	22	9	200	120	908283159
32	11224	11398	11403	7197	22	9	200	120	908283159
33	11024	11198	11203	7198	22	9	200	120	908283159
34	10824	10998	11003	7201	22	9	200	120	908283159
35	10624	10798	10803	7201	22	9	200	120	908283159
36	10424	10598	10603	7201	22	9	200	120	908283159
37	10224	10398	10403	7201	22	9	200	120	908283159
38	10024	10198	10203	7201	22	9	200	120	908283159
39	9824	9998	10003	7201	22	9	200	120	908283159
40	9624	9798	9803	7202	22	9	200	120	908283159
41	9424	9598	9603	7205	22	9	200	120	908283159
42	9224	9398	9403	7206	22	9	200	120	908283159
43	9024	9198	9203	7207	22	9	200	120	908283159
44	8824	8998	9003	7207	22	9	200	120	908283159

WELL COMPLETION DATA

Treatment Interval	Perforation Top (ft)	Perforation Bottom (ft)	Plug Depth (ft)	Vertical Depth (ft)	Perforation Count	Cluster Count	Cluster Spacing	Perforation Phasing	SalesOrder Number
45	8624	8798	8803	7206	22	9	200	120	908283159
46	8424	8598	8603	7205	22	9	200	120	908283159
47	8224	8398	8403	7203	22	9	200	120	908283159

FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3ppt HVFR(FightR EC-4M)		HVFR (FightR EC-4M)		Pump Down		Treated Water		Total Fluid		Slurry Volume
	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Pumped (gal)
1	1000	1000	0	502747	456820	0	0	0	500	9266	458320	513013	523219.62
2	500	499	0	487025	463530	0	0	24696	500	946	464530	513166	529257.12
3	500	499	0	472512	464180	0	0	21378	500	5702	465180	500091	518050.68
4	500	0	0	394988	463993	0	0	20286	500	59	464993	415333	427950.18
5	500	499	0	454176	463807	0	0	25200	500	3634	464807	483509	524447.7
6	500	499	0	487286	463621	0	0	21420	500	6191	464621	515396	534376.92
7	500	499	0	460876	463434	0	0	18480	500	3641	464434	483496	514124.1
8	500	499	0	471600	463248	0	0	21252	500	5277	464248	498628	517220.34
9	500	499	0	477683	463062	0	0	20622	500	4844	464062	503648	522252.78
10	500	499	0	354685	462875	0	0	18606	500	4999	463875	378789	391825.98
11	500	499	0	471653	462689	0	0	17640	500	4874	463689	494666	513410.52
12	500	499	0	477070	462503	0	0	16842	500	3998	463503	498409	517490.82
13	500	499	0	459172	462317	0	0	18900	500	6436	463317	485007	502944.54
14	500	0	0	506735	462130	0	0	16968	500	5042	463130	528745	548217.6
15	500	0	0	469204	461944	0	0	17514	500	3832	462944	490550	510652.38
16	500	0	0	535390	461758	0	0	19110	500	4015	462758	558515	578214.42
17	500	0	0	474665	462041	0	0	17682	500	3522	463041	495869	514014.48
18	500	0	0	284312	461855	0	0	18690	500	74	462855	303076	311388
19	500	0	0	491458	461669	0	0	17094	500	5199	462669	513751	531310.92
20	500	0	0	383318	461483	0	0	14196	500	1503	462483	399017	411035.52
21	500	250	0	491774	461296	0	0	15498	500	4808	462296	512330	527363.76
22	500	0	0	234170	461110	0	0	17850	500	712	462110	252732	257709.9

FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3ppt HVFR(FightR EC-4M)		HVFR (FightR EC-4M)		Pump Down		Treated Water		Total Fluid		Slurry Volume
	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Pumped (gal)
23	500	0	0	510014	460924	0	0	14448	500	2989	461924	527451	545374.2
24	500	0	0	477349	460365	0	0	17430	500	4860	461365	499639	518012.46
25	500	0	0	411713	460179	0	0	14406	500	2082	461179	428201	439899.6
26	500	0	0	578232	459992	0	0	11172	500	11710	460992	601114	617675.52
27	500	0	0	479112	459806	0	0	15666	500	5394	460806	500172	516642.84
28	500	0	0	463342	459620	0	0	12306	500	9282	460620	484930	499577.4
29	500	0	0	481304	459433	0	0	13776	500	4110	460433	499190	515135.46
30	500	0	0	174697	459247	0	0	8820	500	380635	460247	564152	579957.42
31	500	0	0	476993	459061	0	0	11760	500	4807	460061	493560	510778.38
32	500	0	0	430468	458875	0	0	10122	500	3442	459875	444032	458708.46
33	500	250	0	475650	458688	0	0	10500	500	5388	459688	491788	510407.1
34	500	0	0	456772	458502	0	0	8820	500	3332	459502	468924	486573.78
35	500	500	0	483365	458316	0	0	6216	500	4642	459316	494723	513940.98
36	500	0	0	486586	458129	0	0	7014	500	5058	459129	498658	517609.68
37	500	0	0	477084	457943	0	0	6678	500	4588	458943	488350	507462.06
38	500	0	0	471184	457757	0	0	7896	500	2895	458757	481975	501058.32
39	500	0	0	483192	457571	0	0	6846	500	3837	458571	493875	513013.2
40	500	0	0	466500	457384	0	0	5502	500	814	458384	472816	490373.1
41	500	0	0	475082	457198	0	0	6510	500	6402	458198	487994	507234
42	500	0	0	482093	457012	0	0	4578	500	4136	458012	490807	509879.58
43	500	0	0	449078	456825	0	0	4200	500	2211	457825	455489	473720.52
44	500	0	0	465993	456639	0	0	4116	500	3976	457639	474085	493046.4

FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3ppt HVFR(FightR EC-4M)		HVFR (FightR EC-4M)		Pump Down		Treated Water		Total Fluid		Slurry Volume
	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Pumped (gal)
45	500	0	0	483180	456453	0	0	3696	500	4321	457453	491197	510350.82
46	500	0	0	458547	456266	0	0	3024	500	5191	457266	466762	487705.68
47	500	0	0	488599	456080	0	0	2268	500	3577	457080	494444	513756.6
Total	24000	7489	0	21428628	21629630	0	0	617694	23500	578253	21677130	22632064	23464371.84

PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		40/70 Premium White		SS-200 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
1	43200	43630	149300	149310			0	0	192500	192940
2	43200	39710	341800	348200			0	0	385000	387910
3	43200	43490	341800	342080			0	0	385000	385570
4	43200	44770	341800	233481			0	0	385000	278251
5	43200	43220	341800	341200			0	0	385000	384420
6	43200	43430	341800	341900			0	0	385000	385330
7	43200	43200	341800	341825			0	0	385000	385025
8	43200	43210	341800	341810			0	0	385000	385020
9	43200	43340	341800	341800			0	0	385000	385140
10	43200	43200	341800	236220			0	0	385000	279420
11	43200	43420	341800	341800			0	0	385000	385220
12	43200	43225	341800	341840			0	0	385000	385065
13	43200	43200	341800	341830			0	0	385000	385030
14	43200	43150	341800	342808			0	0	385000	385958
15	43200	43210	341800	341840	0	0	0	0	385000	385050
16	0	0	341800	341490	43200	43610	0	0	385000	385100
17	0	0	341800	341855	43200	43230	0	0	385000	385085
18	0	0	341800	126500	43200	43530	0	0	385000	170030
19	0	0	341800	341890	43200	43480	0	0	385000	385370
20	0	0	341800	231559	43200	43260	0	0	385000	274819
21	0	0	341800	280070	43200	43400	0	0	385000	323470
22	0	0	341800	62980	43200	44590	0	0	385000	107570

PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		40/70 Premium White		SS-200 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
23	0	0	341800	339750	43200	43440	0	0	385000	383190
24	0	0	341800	341980	43200	43200	0	0	385000	385180
25	0	0	341800	234381	43200	43230	0	0	385000	277611
26	0	0	341800	341980	43200	43310	0	0	385000	385290
27	0	0	341800	342200	43200	43110	0	0	385000	385310
28	0	0	341800	298791	43200	43550	0	0	385000	342341
29	0	0	341800	342340	43200	43360	0	0	385000	385700
30	0	0	341800	341810	43200	43200	0	0	385000	385010
31	0	0	341800	341820	43200	42190	0	0	385000	384010
32	43200	43220	341800	279370	0	0	0	0	385000	322590
33	43200	43240	341800	343330	0	0	0	0	385000	386570
34	43200	43230	341800	341830	0	0	0	0	385000	385060
35	43200	43340	341800	342180	0	0	0	0	385000	385520
36	43200	43380	341800	341820	0	0	0	0	385000	385200
37	43200	43200	341800	341850	0	0	0	0	385000	385050
38	43200	43210	341800	341800	0	0	0	0	385000	385010
39	43200	43310	341800	341980	0	0	0	0	385000	385290
40	43200	43200	341800	314750	0	0	0	0	385000	357950
41	43200	43220	341800	341820	0	0	0	0	385000	385040
42	43200	43380	341800	342170	0	0	0	0	385000	385550
43	43200	43220	341800	331130	0	0	0	0	385000	374350
44	43200	43200	341800	341800	0	0	0	0	385000	385000

PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		40/70 Premium White		SS-200 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
45	43200	42780	341800	342180	0	0	0	0	385000	384960
46	43200	43270	341800	341800	0	0	0	0	385000	385070
47	43200	43400	341800	342080	0	0	0	0	385000	385480
Total	1339200	1339205	15872100	14751230	691200	693690	0	0	17902500	16784125

AVG / MAX TECHNICAL DATA

Treatment Interval	Treatment Status	Average Pressure (psi)	Average Slurry Rate (bpm)	Average Proppant Conc (ppg)	Maximum Pressure (psi)	Maximum Slurry Rate (bpm)	Maximum Proppant Conc (ppg)
1	Completed	5479	43.36	0.37	6704	51.63	1
2	Completed	6772	74.14	0.77	7410	81.02	2
3	Completed	6754	76.71	0.78	7408	80.12	2
4	Cut	7201	75.58	0.67	8535	80.72	2
5	Completed	7082	77.23	0.82	7901	81.65	2
6	Completed	7329	77.56	0.81	8143	82.4	2
7	Completed	7359	77.38	0.82	8049	80.91	2
8	Completed	7644	77.1	0.79	8393	80.85	2
9	Completed	7118	78.06	0.78	7730	80.82	2
10	Cut	7627	75.67	0.73	8810	80.61	2
11	Completed	6908	77.66	0.77	7798	80.88	2
12	Completed	7037	75.61	0.78	8183	80.19	2
13	Completed	7213	77.81	0.79	8007	80.82	2
14	Completed	7461	75.06	0.73	8548	80.6	2
15	Completed	7656	72.46	0.81	8341	79.75	2
16	Completed	7078	70.62	0.68	8420	80.23	2
17	Completed	7227	77.83	0.8	8183	80.3	2
18	Cut	7850	71.61	0.56	8745	80.99	2
19	Completed	6901	78.65	0.78	7624	80.56	2
20	Cut	7453	73.22	0.7	8692	80.71	2
21	Cut	7381	76.64	0.62	8796	80.66	2
22	Cut	7682	75.06	0.43	8660	80.12	1.69

AVG / MAX TECHNICAL DATA

Treatment Interval	Treatment Status	Average Pressure (psi)	Average Slurry Rate (bpm)	Average Proppant Conc (ppg)	Maximum Pressure (psi)	Maximum Slurry Rate (bpm)	Maximum Proppant Conc (ppg)
23	Completed	7129	70.53	0.73	8990	80.25	2
24	Completed	6687	77.18	0.79	7837	83.18	2
25	Cut	6907	72.63	0.66	8505	80.68	2
26	Completed	7257	67.87	0.64	8503	80.54	2
27	Completed	7419	73.7	0.78	8821	80.48	2
28	Cut	6784	74.31	0.72	9522	83.29	2
29	Completed	7463	77.7	0.79	8348	81.48	2
30	Completed	7384	73.95	0.67	8328	80.88	2
31	Completed	6357	77.65	0.8	7363	80.77	2
32	Completed	7301	77.58	0.73	8626	80.81	2
33	Completed	6738	79.05	0.82	7774	80.66	2
34	Completed	6782	78.85	0.81	8020	80.92	2
35	Completed	7112	78.49	0.81	7735	81.06	2
36	Completed	6784	78.74	0.85	7397	80	2
37	Completed	6548	78.55	0.8	7259	80	2
38	Completed	6618	78.19	0.85	7091	80.37	2
39	Completed	7246	75.87	0.78	8909	80	2
40	Completed	6350	77.5	0.76	7269	80.78	2
41	Completed	6480	77.99	0.8	7132	81.91	2
42	Completed	6736	78.46	0.8	7704	80	2
43	Completed	6732	76.82	0.8	8959	80.54	2
44	Completed	6536	78.59	0.83	7138	80.46	2

AVG / MAX TECHNICAL DATA

Treatment Interval	Treatment Status	Average Pressure (psi)	Average Slurry Rate (bpm)	Average Proppant Conc (ppg)	Maximum Pressure (psi)	Maximum Slurry Rate (bpm)	Maximum Proppant Conc (ppg)
45	Completed	6612	78.75	0.8	7537	80	2
46	Completed	6613	78.91	0.81	8490	80	2
47	Completed	6558	79.15	0.85	7648	80	2

PRESSURE TECHNICAL DATA

Treatment Interval	Open Well Pressure (psi)	Initial Shut In Pressure (psi)	Fracture Gradient (psi/ft)	Max Annulus Pressure (psi)	5 Min Pressure (psi)	10 Min Pressure (psi)	15 Min Pressure (psi)	Final Shut In Pressure (psi)
1	1730	3969	0.98	10	0	0	0	3927
2	3972	4296	1.03	8	0	0	0	4144
3	4053	5003	1.12	12	0	0	0	4485
4	4124	3977	0.98	4.79	3873	3836	3808	3720
5	3750	4238	1.02	9.24	0	0	0	4212
6	3491	4394	1.04	8	0	0	0	4351
7	3648	4326	1.03	5	0	0	0	4304
8	3872	4231	1.02	8	0	0	0	4155
9	3801	4323	1.03	5.49	0	0	0	4189
10	3698	4291	1.03	8.14	4134	4075	4034	3870
11	3980	4428	1.05	9	0	0	0	4280
12	4133	4374	1.04	1	0	0	0	4352
13	4102	4383	1.04	7	0	0	0	4336
14	4124	4388	1.04	5.17	0	0	0	4340
15	4016	4745	1.09	5	0	0	0	4705
16	3307	4468	1.05	8	0	0	0	4441
17	3796	4400	1.04	7	0	0	0	4324
18	4068	4574	1.07	6	0	0	0	4203
19	4074	4657	1.08	7	0	0	0	4421
20	4068	4415	1.04	7	0	0	0	4282
21	4117	4538	1.06	8	0	0	0	4345
22	4183	4475	1.05	9	0	0	0	4128

PRESSURE TECHNICAL DATA

Treatment Interval	Open Well Pressure (psi)	Initial Shut In Pressure (psi)	Fracture Gradient (psi/ft)	Max Annulus Pressure (psi)	5 Min Pressure (psi)	10 Min Pressure (psi)	15 Min Pressure (psi)	Final Shut In Pressure (psi)
23	4120	4614	1.07	0	0	0	0	4407
24	4176	4290	1.03	4	0	0	0	4260
25	4063	4430	1.05	5	0	0	0	4288
26	4405	4377	1.04	9	0	0	0	4201
27	3972	4524	1.06	6	0	0	0	4344
28	4099	4780	1.1	8.53	0	0	0	4541
29	4067	4515	1.06	6	0	0	0	4389
30	4186	4796	1.1	6	0	0	0	4574
31	4186	4432	1.05	8	0	0	0	4223
32	3975	4431	1.05	5	0	0	0	4374
33	4001	4532	1.06	9	0	0	0	4373
34	4181	4612	1.07	7	0	0	0	4549
35	5356	4330	1.03	2	0	0	0	4292
36	3731	4505	1.06	1	0	0	0	4411
37	4223	4536	1.06	0	0	0	0	4519
38	4142	4602	1.07	1	0	0	0	4590
39	4264	4469	1.05	2	0	0	0	4428
40	4241	4478	1.06	6	0	0	0	4400
41	4308	4569	1.07	2	0	0	0	4462
42	4325	4782	1.1	0	0	0	0	4741
43	4329	4573	1.07	0	0	0	0	4546
44	4302	4532	1.06	0	0	0	0	4400

PRESSURE TECHNICAL DATA

Treatment Interval	Open Well Pressure (psi)	Initial Shut In Pressure (psi)	Fracture Gradient (psi/ft)	Max Annulus Pressure (psi)	5 Min Pressure (psi)	10 Min Pressure (psi)	15 Min Pressure (psi)	Final Shut In Pressure (psi)
45	4295	4591	1.07	0	0	0	0	4362
46	4454	4720	1.09	0	0	0	0	4694
47	4104	4627	1.08	3	4445	4393	4368	4367