



# WELL STIMULATION REPORT

Bayswater Exploration

**Ruby East 2**

05-123-51740-00

March 09, 2023

## Engineering Executive Summary

On Sunday, February 05, 2023 the stimulation of treatment(s) was performed in the Niobrara formation on the Ruby East 2 well in WELD county, COLORADO.

**The proposed treatment(s) consisted of:**

25,000	gallons of	15% HCl
1,113,200	gallons of	3gpt FR Water (FightR EC-1)
21,258,858	gallons of	FR Water (FightR EC-1)
0	gallons of	Treated Water
2,075,150	pounds of	100 Mesh Premium White
16,597,350	pounds of	30/50 Premium White

**The actual treatment(s) consisted of:**

4,491	gallons of	15% HCl
23,111,989	gallons of	3gpt FR Water (FightR EC-1)
0	gallons of	FR Water (FightR EC-1)
714,798	gallons of	Treated Water
2,088,344	pounds of	100 Mesh Premium White
16,609,581	pounds of	30/50 Premium White

49 of 49 treatment(s) were fully completed. 0 treatment(s) were skipped, and 0 treatment(s) were screened out or otherwise cut short of design.

The well was first opened Sunday, February 05, 2023 at 15:13 with an opening pressure of 1,283.0 psi.

The total amount of proppant pumped was 18,697,925.0 lbm with an average concentration of 0.8 ppg and maximum concentration of 4.0 ppg. Treating pressure averaged 7704.47 psi and rate averaged 94.92 bpm.

The operation came offline at 22:41 and the well was shut in Wednesday, March 01, 2023 at 22:58 with a final shut-in pressure of 4,458.0 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,

Tom Nowak

Cat Donley

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	18085	18089	18090	7299	20	9	200	120	908346520
2	17873	18047	18052	7299	27	9	200	120	908346520
3	17673	17847	17852	7300	27	9	200	120	908346520
4	17473	17647	17652	7301	27	9	200	120	908346520
5	17273	17447	17452	7302	27	9	200	120	908346520
6	17073	17247	17252	7303	27	9	200	120	908346520
7	16873	17047	17052	7303	27	9	200	120	908346520
8	16673	16847	16852	7304	27	9	200	120	908346520
9	16473	16647	16652	7305	27	9	200	120	908346520
10	16273	16447	16452	7306	27	9	200	120	908346520
11	16073	16247	16252	7307	27	9	200	120	908346520
12	15873	16047	16052	7308	27	9	200	120	908346520
13	15673	15847	15852	7308	27	9	200	120	908346520
14	15473	15647	15652	7309	27	9	200	120	908346520
15	15273	15447	15452	7310	27	9	200	120	908346520
16	15073	15247	15252	7311	27	9	200	120	908346520
17	14873	15047	15052	7312	27	9	200	120	908346520
18	14673	14847	14852	7312	27	9	200	120	908346520
19	14473	14647	14652	7313	27	9	200	120	908346520
20	14273	14447	14452	7314	27	9	200	120	908346520
21	14073	14247	14252	7315	27	9	200	120	908346520
22	13873	14047	14052	7316	27	9	200	120	908346520

### 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	13673	13847	13852	7317	27	9	200	120	908346520
24	13473	13647	13652	7317	27	9	200	120	908346520
25	13273	13447	13452	7318	27	9	200	120	908346520
26	13073	13129	13252	7319	27	9	200	120	908346520
27	12873	13047	13052	7320	27	9	200	120	908346520
28	12673	12847	12852	7321	27	9	200	120	908346520
29	12473	12647	12652	7321	27	9	200	120	908346520
30	12273	12447	12452	7322	27	9	200	120	908346520
31	12073	12247	12252	7323	27	9	200	120	908346520
32	11873	12047	12052	7324	27	9	200	120	908346520
33	11673	11847	11852	7325	27	9	200	120	908346520
34	11473	11647	11652	7326	27	9	200	120	908346520
35	11273	11447	11452	7326	27	9	200	120	908346520
36	11073	11247	11252	7327	27	9	200	120	908346520
37	10873	11047	11052	7328	27	9	200	120	908346520
38	10673	10847	10852	7329	27	9	200	120	908346520
39	10473	10647	10652	7330	27	9	200	120	908346520
40	10273	10447	10452	7330	27	9	200	120	908346520
41	10073	10247	10252	7331	27	9	200	120	908346520
42	9873	10047	10052	7332	27	9	200	120	908346520
43	9673	9847	9852	7333	27	9	200	120	908346520
44	9473	9647	9652	7334	27	9	200	120	908346520

## 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	9273	9447	9452	7335	27	9	200	120	908346520
46	9073	9247	9252	7335	27	9	200	120	908346520
47	8873	9047	9052	7336	27	9	200	120	908346520
48	8673	8847	8852	7337	27	9	200	120	908346520
49	8473	8647	8652	7331	27	9	200	120	908346520

### FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3gpt FR Water (FightR EC-1)		FR Water (FightR EC-1)		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)	Pumped (gal)
1	1000	998	0	472636	462215	0	0	0	463215	473634	483111.3
2	500	499	0	473470	462988	0	0	16590	463488	490559	507530.1
3	500	0	0	475128	462801	0	0	22764	463301	497892	517005.72
4	500	0	0	472284	462615	0	0	24108	463115	496392	515074.98
5	500	0	0	482175	462429	0	0	23100	462929	505275	523816.86
6	500	499	25300	472089	437082	0	0	21336	462882	493924	511092.12
7	500	499	25300	471947	436896	0	0	21000	462696	493446	511161
8	500	499	25300	472578	436710	0	0	21420	462510	494497	512326.08
9	500	0	25300	470571	436524	0	0	19992	462324	490563	509210.1
10	500	499	25300	476914	436337	0	0	21336	462137	498749	516507.6
11	500	499	25300	475676	436151	0	0	17850	461951	494025	511563.36
12	500	499	25300	474931	435965	0	0	19908	461765	495338	513388.68
13	500	0	25300	502512	435778	0	0	18564	461578	521076	540314.88
14	500	0	25300	470026	435592	0	0	19446	461392	489472	508317.18
15	500	0	25300	470734	435406	0	0	17136	461206	487870	506737.14
16	500	0	25300	470500	435220	0	0	21504	461020	492004	510968.64
17	500	0	25300	502118	435033	0	0	18438	460833	520556	539383.32
18	500	0	25300	468395	434847	0	0	21840	460647	490235	508963.14
19	500	0	25300	465894	434661	0	0	28602	460461	494496	512247.12
20	500	0	25300	468869	434475	0	0	25158	460275	494027	512301.72
21	500	0	25300	466110	430509	0	0	14238	456309	480348	497991.9
22	500	0	25300	468943	430323	0	0	20958	456123	489901	508605.3

### FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3gpt FR Water (FightR EC-1)		FR Water (FightR EC-1)		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)	Pumped (gal)
23	500	0	25300	474032	430137	0	0	14070	455937	488102	507819.9
24	500	0	25300	464509	429950	0	0	15666	455750	480175	498473.22
25	500	0	25300	467228	429764	0	0	15204	455564	482432	501544.26
26	500	0	25300	464804	429578	0	0	13692	455378	478496	496701.66
27	500	0	25300	466250	429391	0	0	15960	455191	482210	500666.04
28	500	0	25300	465828	429205	0	0	12348	455005	478176	495900.3
29	500	0	25300	466188	429019	0	0	10920	454819	477108	494931.78
30	500	0	25300	463554	428833	0	0	11424	454633	474978	492914.52
31	500	0	25300	466765	428646	0	0	9912	454446	476677	497391.72
32	500	0	25300	466750	428460	0	0	11256	454260	478006	495996.9
33	500	0	25300	468794	428274	0	0	9954	454074	478748	496272
34	500	0	25300	465654	428087	0	0	12558	453887	478212	496002.36
35	500	0	25300	470444	427901	0	0	15960	453701	486404	503983.62
36	500	0	25300	465866	427715	0	0	17892	453515	483758	501710.58
37	500	0	25300	470780	427529	0	0	15204	453329	485984	503574.96
38	500	0	25300	477660	427342	0	0	12642	453142	490302	508235.7
39	500	0	25300	468953	427156	0	0	16632	452956	485585	503294.82
40	500	0	25300	466562	426970	0	0	7812	452770	474374	492650.76
41	500	0	25300	468095	426783	0	0	6342	452583	474437	492159.36
42	500	0	25300	471941	426597	0	0	6174	452397	478115	496351.38
43	500	0	25300	509295	426411	0	0	5376	452211	514671	532899.78
44	500	0	25300	464539	426225	0	0	5040	452025	469579	487554.06

## FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3gpt FR Water (FightR EC-1)		FR Water (FightR EC-1)		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)	Pumped (gal)
45	500	0	25300	469260	426038	0	0	3738	451838	472998	490567.98
46	500	0	25300	464720	425852	0	0	4494	451652	469214	488225.22
47	500	0	25300	468145	425666	0	0	3360	451466	471505	489115.2
48	500	0	25300	464718	425479	0	0	2898	451279	467616	485783.34
49	500	0	25300	466155	425293	0	0	2982	451093	469137	487027.38
<b>Total</b>	<b>25000</b>	<b>4491</b>	<b>1113200</b>	<b>23111989</b>	<b>21258858</b>	<b>0</b>	<b>0</b>	<b>714798</b>	<b>22397058</b>	<b>23831278</b>	<b>24715367.04</b>

## PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
1	42350	42720	150150	150321	192500	193041
2	42350	42360	342650	342740	385000	385100
3	42350	42360	342650	342660	385000	385020
4	42350	42390	342650	342740	385000	385130
5	42350	42360	342650	342720	385000	385080
6	42350	42420	342650	342730	385000	385150
7	42350	42350	342650	342740	385000	385090
8	42350	42390	342650	342720	385000	385110
9	42350	43300	342650	340500	385000	383800
10	42350	42390	342650	342740	385000	385130
11	42350	41910	342650	340790	385000	382700
12	42350	42400	342650	342690	385000	385090
13	42350	42619	342650	338480	385000	381099
14	42350	42550	342650	342700	385000	385250
15	42350	44028	342650	342660	385000	386688
16	42350	41660	342650	343420	385000	385080
17	42350	48420	342650	343680	385000	392100
18	42350	42700	342650	342840	385000	385540
19	42350	42807	342650	337460	385000	380267
20	42350	42380	342650	342920	385000	385300
21	42350	41670	342650	343230	385000	384900
22	42350	42500	342650	342600	385000	385100

## PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
23	42350	41560	342650	342400	385000	383960
24	42350	42400	342650	342580	385000	384980
25	42350	42580	342650	342480	385000	385060
26	42350	42280	342650	343000	385000	385280
27	42350	42080	342650	343440	385000	385520
28	42350	42400	342650	341860	385000	384260
29	42350	42430	342650	342680	385000	385110
30	42350	41740	342650	342720	385000	384460
31	42350	48000	342650	342610	385000	390610
32	42350	42580	342650	342460	385000	385040
33	42350	42390	342650	342680	385000	385070
34	42350	42360	342650	344880	385000	387240
35	42350	42400	342650	342700	385000	385100
36	42350	42340	342650	342780	385000	385120
37	42350	42370	342650	342680	385000	385050
38	42350	42370	342650	342460	385000	384830
39	42350	42400	342650	342680	385000	385080
40	42350	42170	342650	342750	385000	384920
41	42350	42380	342650	342680	385000	385060
42	42350	42440	342650	345060	385000	387500
43	42350	42370	342650	343250	385000	385620
44	42350	42000	342650	343820	385000	385820

## PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
45	42350	42390	342650	343640	<b>385000</b>	<b>386030</b>
46	42350	42080	342650	342500	<b>385000</b>	<b>384580</b>
47	42350	42380	342650	342680	<b>385000</b>	<b>385060</b>
48	42350	42380	342650	357340	<b>385000</b>	<b>399720</b>
49	42350	42390	342650	342690	<b>385000</b>	<b>385080</b>
<b>Total</b>	<b>2075150</b>	<b>2088344</b>	<b>16597350</b>	<b>16609581</b>	<b>18672500</b>	<b>18697925</b>

### 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	5831	68.87	0.41	7626	71.51	1
2	Completed	6918	95.94	0.81	7722	101.76	2
3	Completed	7194	96.55	0.79	7663	100.7	2
4	Completed	7581	94.76	0.78	8426	100.51	2
5	Completed	7683	97.01	0.81	8201	100.21	2
6	Completed	7988	87.79	0.8	8789	95.51	4
7	Completed	7894	93.52	0.8	8676	100.2	4
8	Completed	8045	92.61	0.81	8492	100.27	4
9	Completed	7864	84.24	0.79	8477	98.32	4
10	Completed	7978	92.47	0.8	8729	103.74	4
11	Completed	7889	91.28	0.8	8456	100.16	3
12	Completed	7943	92.21	0.82	8706	100.66	4
13	Completed	7838	93.53	0.77	8568	101.21	4
14	Completed	7960	93.23	0.81	8297	100.06	4
15	Completed	7794	94.41	0.83	8272	100.33	4
16	Completed	8014	90.12	0.8	8625	98.33	3.03
17	Completed	7645	92.53	0.8	8838	100.54	4
18	Completed	7695	97.72	0.79	8317	100.63	4
19	Completed	7962	86.05	0.79	8761	95.32	4
20	Completed	7592	96.79	0.77	9153	101.68	3.94
21	Completed	7688	94.37	0.79	9105	100	3.86
22	Completed	8100	96.51	0.81	9232	100.18	4

### 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	7825	98.74	0.86	9165	101.03	4
24	Completed	8185	97.35	0.78	9156	100.21	3.8
25	Completed	7959	96.59	0.8	8696	100.52	3.88
26	Completed	7777	98.32	0.8	9110	100.92	3.96
27	Completed	7833	97.77	0.81	8739	100.61	4
28	Completed	8070	96.86	0.77	9125	106.56	3.85
29	Completed	8013	95.07	0.81	8943	100.37	3.98
30	Completed	7401	98.24	0.8	9107	100.67	3.9
31	Completed	7114	97.32	0.84	8562	100.27	4
32	Completed	7813	98.34	0.82	9015	105.6	4
33	Completed	7938	98	0.84	9179	103.62	4
34	Completed	7268	98.25	0.81	8850	100.78	4
35	Completed	7543	98.81	0.81	9039	100.63	4
36	Completed	7814	98.26	0.8	8899	100.99	3.98
37	Completed	8089	97.39	0.84	9254	101.05	4
38	Completed	7606	98.04	0.81	8474	101.33	4
39	Completed	7961	97.4	0.82	9232	101.82	4
40	Completed	7735	97.82	0.83	8937	100.5	4
41	Completed	7840	98.86	0.84	9081	100.69	4
42	Completed	7751	97.52	0.84	9019	101.05	4
43	Completed	8026	86.97	0.77	9201	99.99	2
44	Completed	7712	99.05	0.83	8720	100.77	4

### 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	7389	96	0.77	8382	101.74	4
46	Completed	7661	98.24	0.85	8539	100.19	4
47	Completed	7784	98.27	0.86	8848	100.7	4
48	Completed	7196	98.41	0.84	8493	100.39	4
49	Completed	7118	96.56	0.87	8449	100.52	4

### 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	1283	3925	0.97	0	0	0	0	3918
2	4762	4036	0.99	0	0	0	0	3999
3	3874	4424	1.04	0	0	0	0	4369
4	4027	4360	1.03	0	0	0	0	4331
5	3933	4360	1.03	0	0	0	0	4355
6	4072	4356	1.03	0	0	0	0	4293
7	4100	4390	1.03	0	0	0	0	4314
8	4301	4524	1.05	0	0	0	0	4458
9	4239	4519	1.05	0	0	0	0	4548
10	4304	4465	1.04	0	0	0	0	4384
11	4369	4996	1.12	0	0	0	0	4811
12	4410	4796	1.09	0	0	0	0	4736
13	4305	4678	1.07	0	0	0	0	4429
14	4368	4478	1.05	0	0	0	0	4388
15	4182	4377	1.03	0	0	0	0	4587
16	4247	4471	1.04	0	0	0	0	4414
17	4424	4514	1.05	0	0	0	0	4404
18	4417	4969	1.11	0	0	0	0	4923
19	4486	4626	1.07	0	0	0	0	4512
20	4323	4676	1.07	0	0	0	0	4552
21	4230	4582	1.06	0	0	0	0	3552
22	4367	4945	1.11	0	0	0	0	4789

### 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	4416	4277	1.02	0	0	0	0	4980
24	4420	4774	1.08	0	0	0	0	4670
25	4432	4538	1.05	0	0	0	0	4351
26	4676	5056	1.12	0	0	0	0	5026
27	4451	4245	1.01	0	0	0	0	4457
28	4444	4869	1.1	0	0	0	0	4852
29	4566	4821	1.09	0	0	0	0	4466
30	4443	4501	1.05	0	0	0	0	4372
31	4427	4563	1.06	0	0	0	0	4490
32	4449	4895	1.1	0	0	0	0	4525
33	4449	4645	1.07	0	0	0	0	4538
34	4503	4820	1.09	0	0	0	0	4741
35	4563	4687	1.07	0	0	0	0	4559
36	4486	5033	1.12	0	0	0	0	4593
37	4502	4697	1.07	0	0	0	0	4589
38	4535	4692	1.07	0	0	0	0	4675
39	4539	4728	1.08	0	0	0	0	4664
40	4715	4821	1.09	0	0	0	0	4779
41	4419	4950	1.11	0	0	0	0	4779
42	4522	5369	1.16	0	0	0	0	4555
43	4424	4701	1.07	0	0	0	0	4649
44	4345	5487	1.18	0	0	0	0	0

### 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	4446	4857	1.1	0	0	0	0	4706
46	4419	4806	1.09	0	0	0	0	4588
47	4376	4754	1.08	0	0	0	0	4672
48	4405	4855	1.1	0	0	0	0	4808
49	4297	4673	1.07	0	4532	4494	4466	4458