

4/2/2024

# EAGLE NEWSLETTER



## Spinner/Temp-Tracer Comparison

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### Background:

An Injection profile with Spinner/Temp?pressure as well as a Tracer Log was called out for a three active zone Injector. The well has 7” 29# Production Casing with a permanent packer set at 8384’. The end of tubing is 8402’. Three perforation zones exist.

Cycle 3: 8391’-8424’ (11’ of perfs covered by tubing)

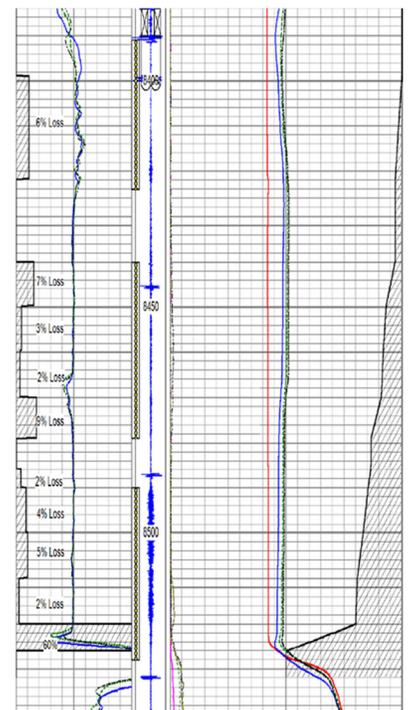
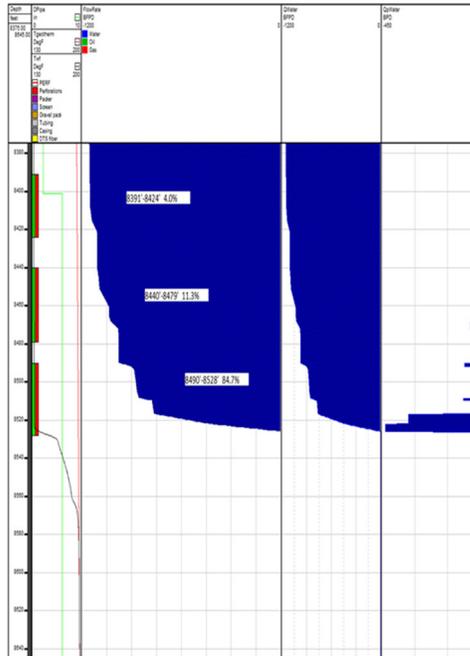
Cycle 2: 8440’-8479’

Cycle 1: 8490’-8528’

The well was online at constant injection rate and pressure for 72 hours at about 1150 BWPD.

**Day 1:** Injection Profile with Spinner/Temp/Pressure as well as Time Lapse Shut In Temperature Performed.

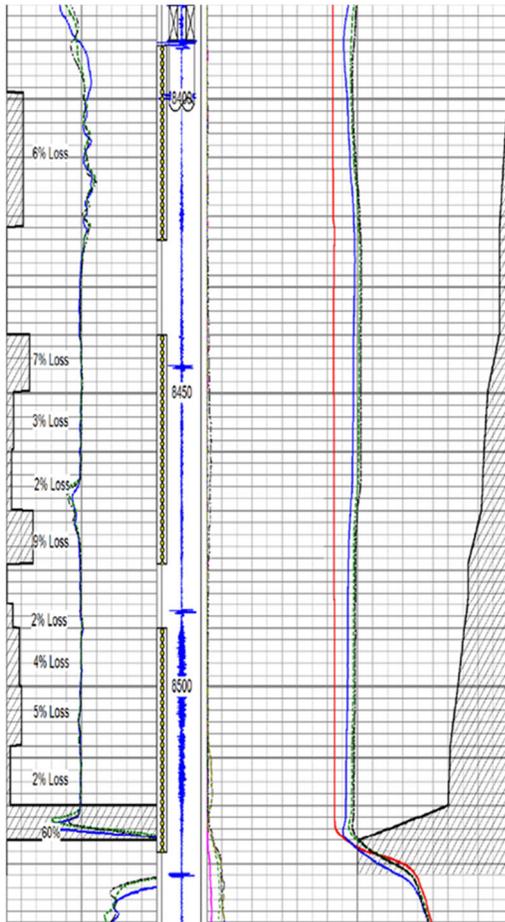
**Day 2:** Tracer Survey performed.





Injection Profile

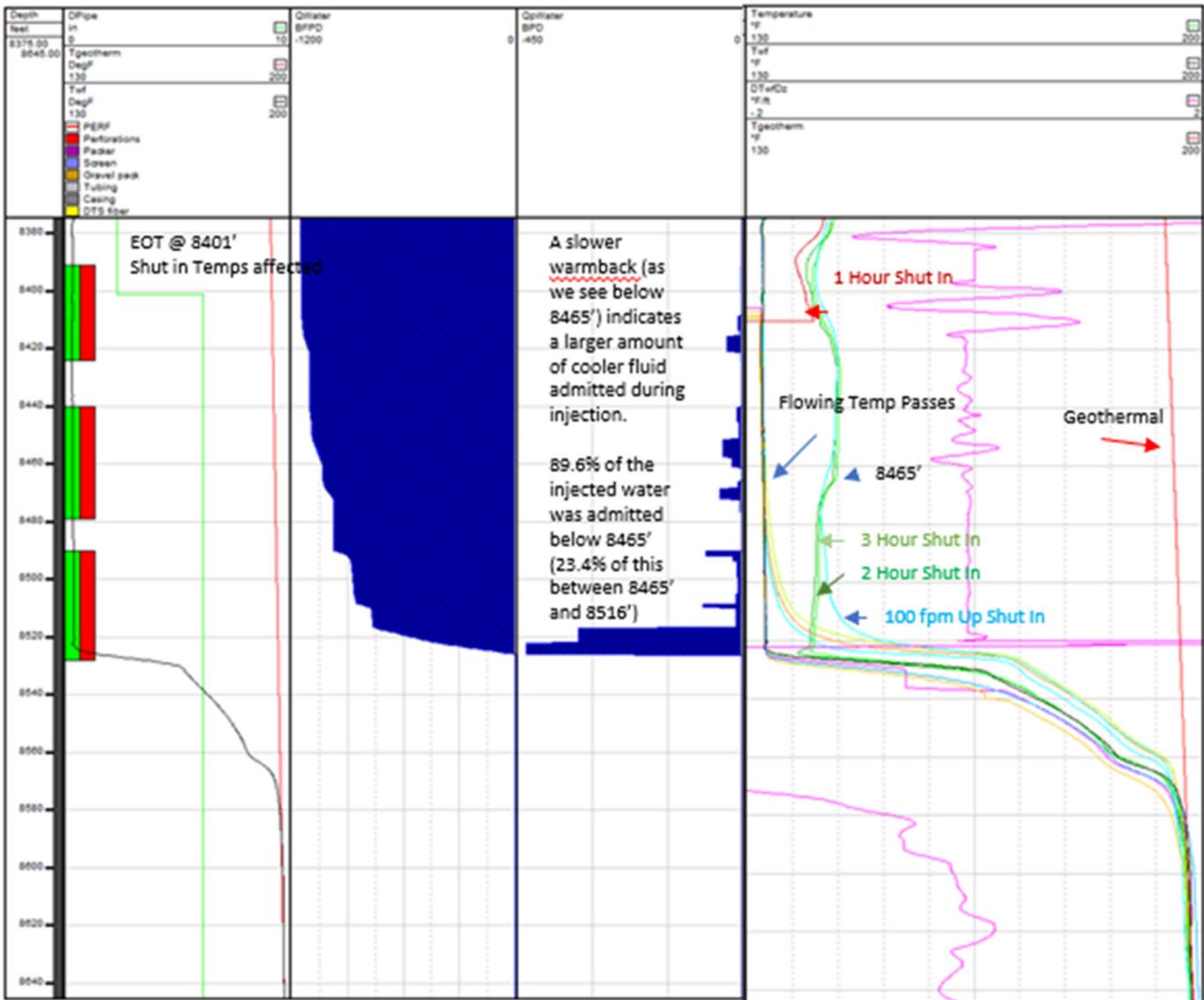
Depth		Profile	Q-Water-STP	QI-Water-STP	Total Water and Percentage
Feet			BFPD	BFPD	
Surface	8391	Inject	-1149.10	0.00	-1149.1
<b>Total Well Injection</b>					<b>-1149.10</b>
8391-8424				-46.22	4.0%
8391	8396	Inject	-1149.10	-2.43	0.2%
8396	8400.5	Inject	-1146.67	-2.22	0.2%
8400.5	8405	Inject	-1144.45	0.00	0.0%
8405	8408.5	Inject	-1144.45	0.00	0.0%
8408.5	8413.5	Inject	-1144.45	-7.39	0.6%
8413.5	8415.5	Inject	-1137.06	-3.37	0.3%
8415.5	8421	Inject	-1133.69	-29.60	2.6%
8421	8424	Inject	-1104.09	-1.21	0.1%
8440-8479				-130.00	11.3%
8440	8445.25	Inject	-1102.88	-9.20	0.8%
8445.25	8451.25	Inject	-1093.68	-5.86	0.5%
8451.25	8457.5	Inject	-1087.82	-38.20	3.3%
8457.5	8461	Inject	-1049.62	-19.90	1.7%
8461	8465.75	Inject	-1029.72	0.00	0.0%
8465.75	8468.25	Inject	-1029.72	-8.60	0.7%
8468.25	8472	Inject	-1021.12	-44.90	3.9%
8472	8476.75	Inject	-976.22	-3.34	0.3%
8476.75	8479	Inject	-972.88	0.00	0.0%
8490-8528				-972.88	84.7%
8490	8491.75	Inject	-972.88	-73.10	6.4%
8491.75	8493.5	Inject	-899.78	-19.00	1.7%
8493.5	8499.25	Inject	-880.78	-9.50	0.8%
8499.25	8505	Inject	-871.28	-7.48	0.7%
8505	8508.5	Inject	-863.80	-12.50	1.1%
8508.5	8509.75	Inject	-851.30	-77.80	6.8%
8509.75	8516.75	Inject	-773.50	-12.50	1.1%
8516.75	8522	Inject	-761.00	-328.00	28.5%
8522	8526	Inject	-433.00	-433.00	37.7%
8526	8528	Inject	0.00	0.00	0.0%



Tracer

The vast majority of injection is occurring through the lower area of the bottom set of three sets of perforations. Some cycling below the bottom perforations and slight movement behind pipe is possible. All water, however; is making it to the perforations and into the formation. Temperature analysis resolves perfs behind tubing

	Spinner/Temp	Tracer
8391-8424	4.0%	6%
8440-8479	11.3%	21%
8490-8528	84.7%	73%



Cycling seen on spinner and temperature until about 8558'  
All injected cycling water is still injecting out of lower perfs

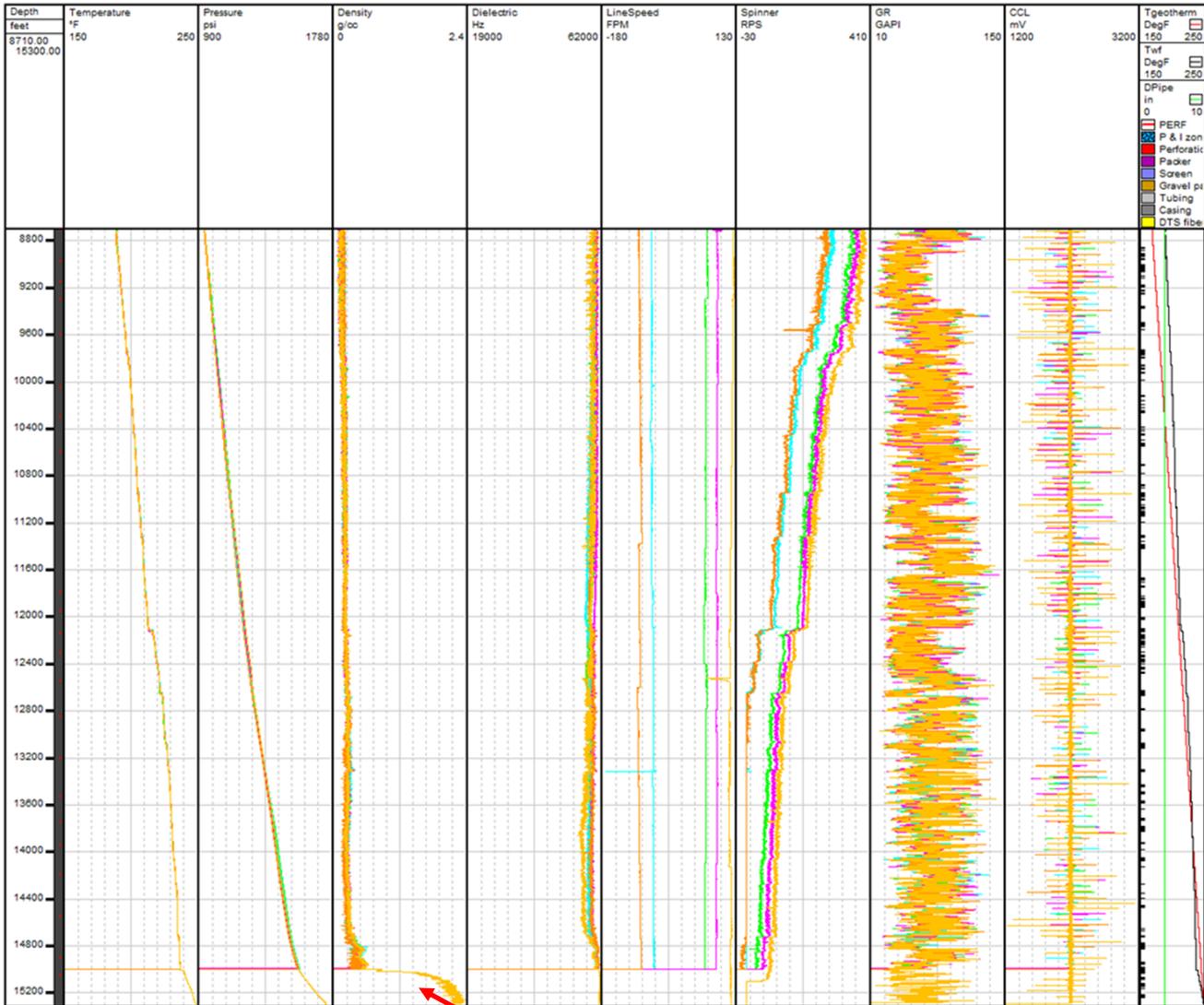
Some movement of injected water also likely behind pipe as seen by temperature response. However, water is not descending below shale barrier at 8565'. Any cycling of water in pipe or behind pipe is making it back into perforations for injection

## High Stage/Perf Count Gas well

### Background:

This Wyoming Gas well has 28 stages with 276 perforation clusters. A Production log was run for evaluation and include in a field wide study and history match.

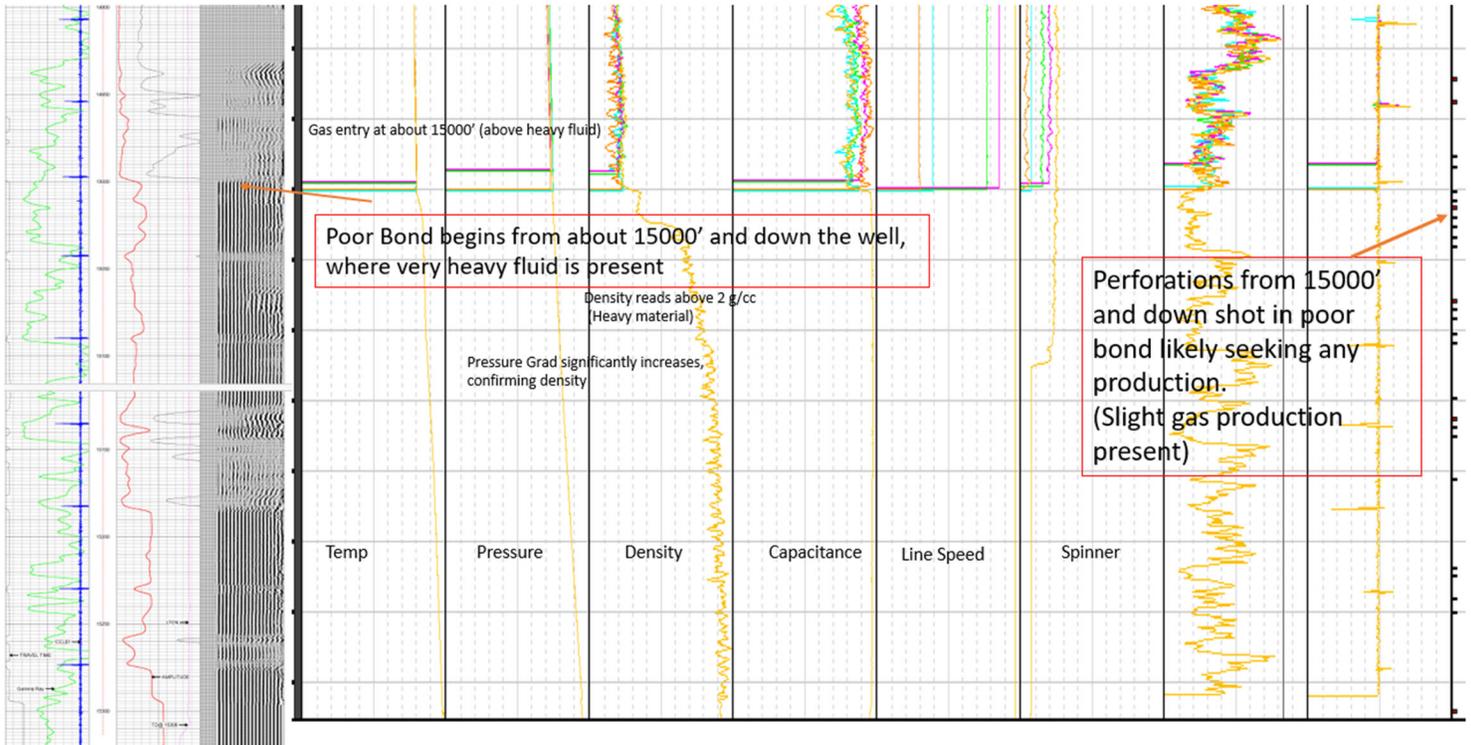
Water production in upper and mid zones is prevalent throughout the field.



A very high density fluid/slurry is encountered below 15000', disrupting spinner data and reading over 2 g/cc on the R/A density tool

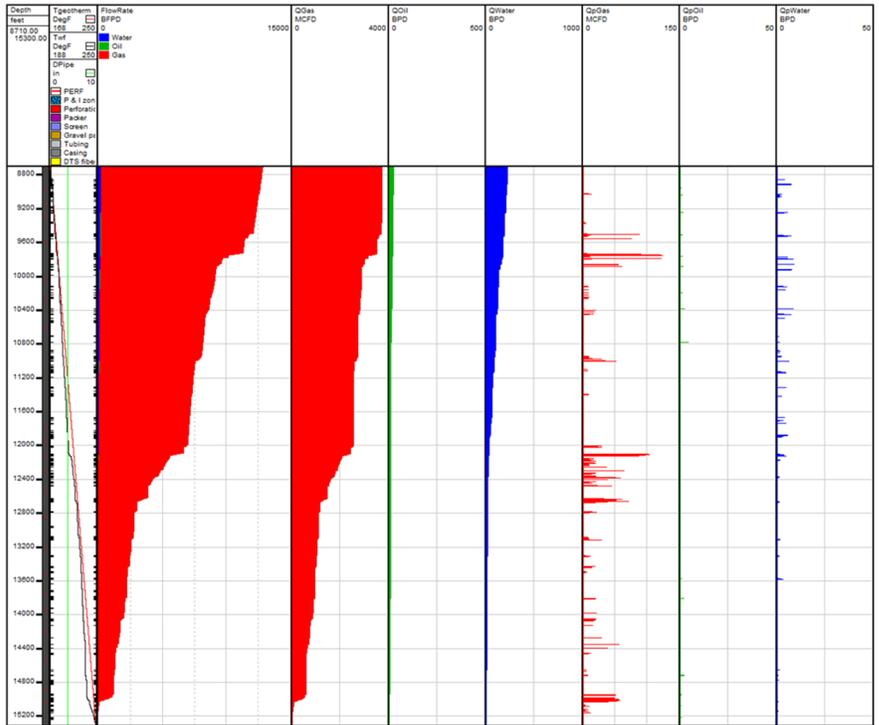
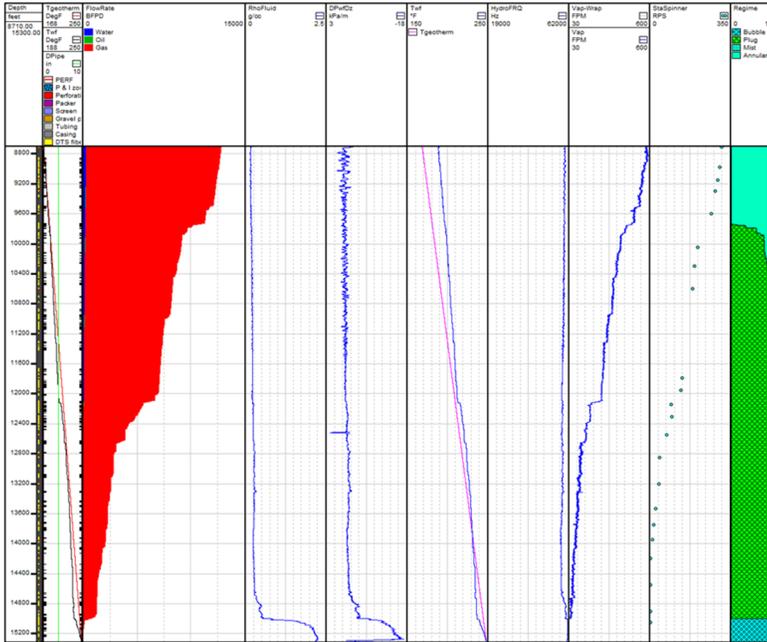
## High Stage/Perf Count Gas well

Poor bond below 15000' where heavy fluid is present indicates communication to bottom and an influx.



## High Stage/Perf Count Gas well

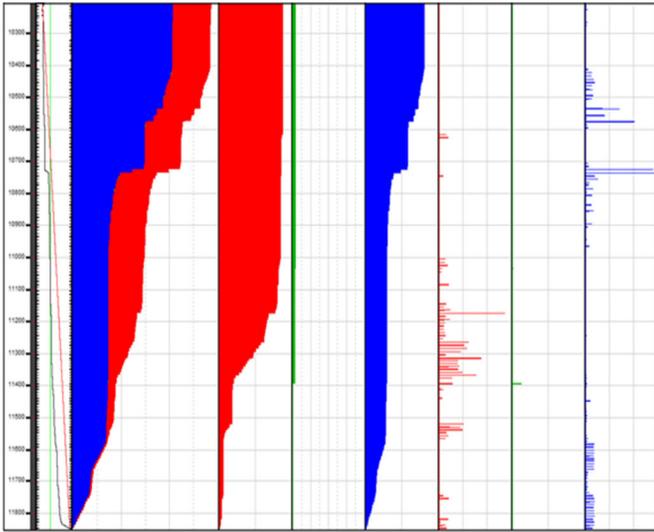
The well; however, is a strong gas producer and the data helps evaluate the field and plan future drilling.



## Gas well / Reduction in Water Production

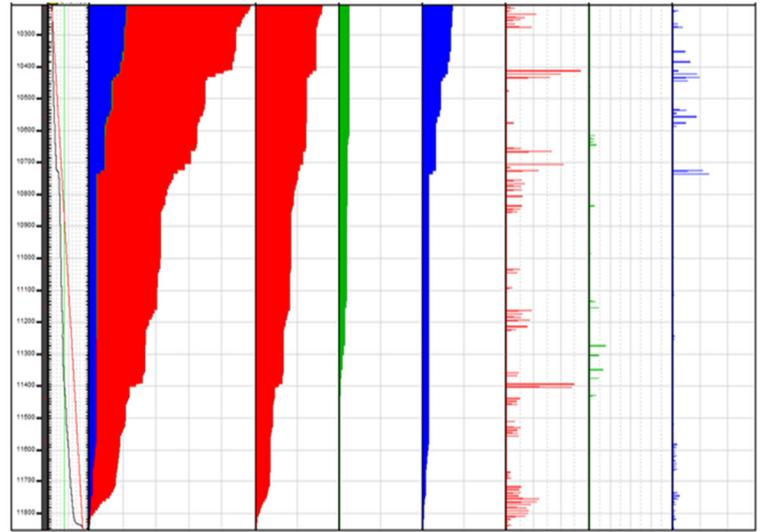
### Background:

This Gas well has 12 stages with 166 perforation clusters. A Production log was run for evaluation and include in a field wide study and history match. The initial log had significant frac fluid still returning. The second log was run about a month later with more than double the gas production and significant reduction in water / frac fluid production



Run 1 – February 16, 2024

QWaterSurf BFPD 2454  
QOilSurf BFPD 1  
QGasSurf MCFD 1322



Run 2 – March 19, 2024

QWaterSurf BFPD 1088  
QOilSurf BFPD 23  
QGasSurf MCFD 3485

## Gas well / Reduction in Water Production

### Background:

Detail was analyzed at the cluster level. Stage level seen here for clarity

Depth	Qp-Water-STP	Qp-Oil-STP	Qp-Gas-STP	Total Water and Percentage	Total Oil and Percentage	Total Gas and Percentage
feet	BFPD	BFPD	MCFD			
<b>Total Well Production</b>				<b>2454.50</b>	<b>1.39</b>	<b>1321.97</b>
10215-10385	17.97	0.00	0.00	1%	0%	0%
10412-10557	453.91	0.00	0.00	18%	0%	0%
10565-10706	234.30	0.00	32.20	10%	0%	2%
10715-10855	817.78	0.00	7.50	33%	0%	1%
10864-11005	54.04	0.00	12.40	2%	0%	1%
11014-11155	0.00	0.19	81.30	0%	14%	6%
11163-11304	2.49	0.00	486.17	0%	0%	37%
11314-11439	13.36	1.20	438.20	1%	86%	33%
11447-11574	61.43	0.00	189.00	3%	0%	14%
11582-11709	375.69	0.00	0.00	15%	0%	0%
11717-11847	423.53	0.00	75.20	17%	0%	6%

Depth	Qp-Water-STP	Qp-Oil-STP	Qp-Gas-STP	Total Water and Percentage	Total Oil and Percentage	Total Gas and Percentage
feet	BFPD	BFPD	MCFD			
<b>Total Well Production</b>				<b>1088.60</b>	<b>22.55</b>	<b>3485.30</b>
10215-10385	176.80	0.00	315.20	16%	0%	9%
10412-10557	402.50	0.10	513.91	37%	0%	15%
10565-10706	57.60	4.70	362.80	5%	21%	10%
10715-10855	239.00	1.10	450.76	22%	5%	13%
10864-11005	1.29	0.25	0.00	0%	1%	0%
11014-11155	3.67	3.50	87.40	0%	16%	3%
11163-11304	8.05	6.10	318.60	1%	27%	9%
11314-11439	0.00	6.80	494.00	0%	30%	14%
11447-11574	1.19	0.00	225.40	0%	0%	6%
11582-11709	96.66	0.00	32.98	9%	0%	1%
11717-11847	101.84	0.00	684.25	9%	0%	20%

**Run 1**

Qwater BFPD      2454  
Qoil BFPD            1  
Qgas MCFD          1322

Actual rates during logging

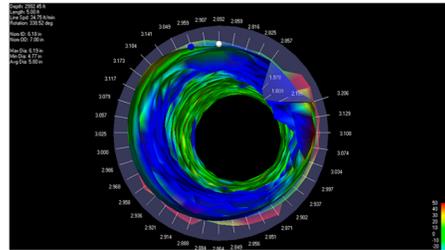
**Run 2**

Qwater BFPD      1088  
Qoil BFPD            23  
Qgas MCFD          3485

### Lagniappe!

Multi Detector Pulsed Neutron: Sigma, Oxygen Activation and spectral CO will be more available in the near future. Stay tuned!

Casing Inspection /real time visualization for EPA requirements, find damage, holes and wear., and protect from future loss or waste of money.



Working with excellent wireline service providers enable us to combine expertise to bring you the most value, service and knowledge for your assets. Thank you Production Logging Services and Excel Wireline, as well as many others!



Strong Headwinds, gravel trails and hills. What was not to love in this years 100k-200k Open Range Gravel Bike Race in Pratt Kansas! A great and challenging time.!

