



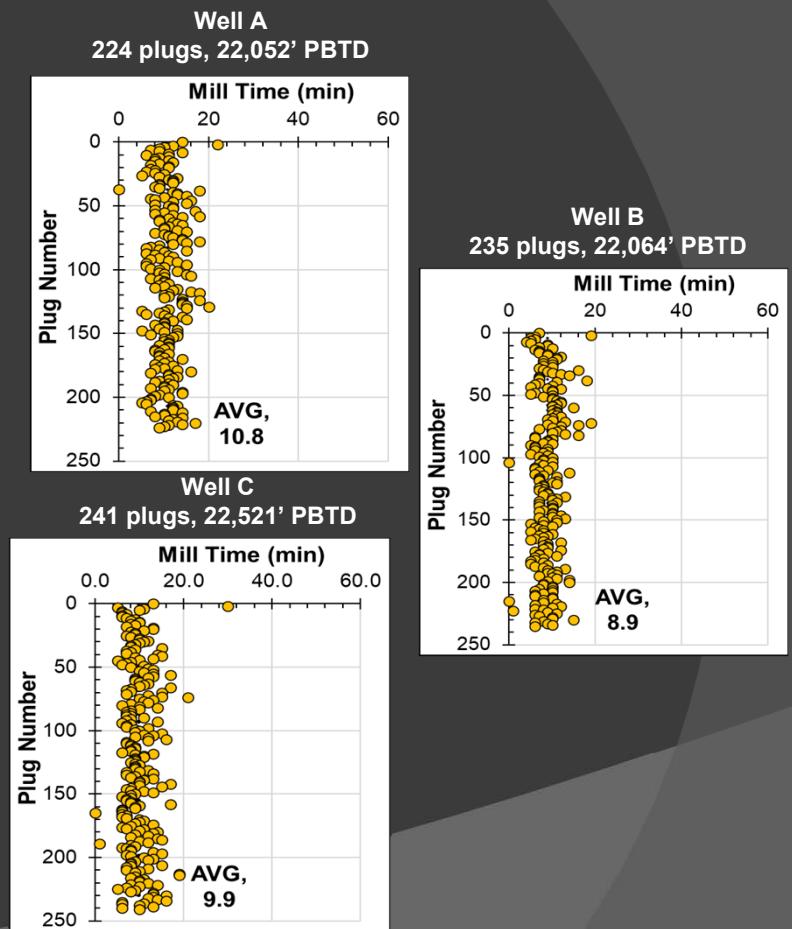
# BitSavR Case Study

October 2023

Downhole. Workover. Rentals.

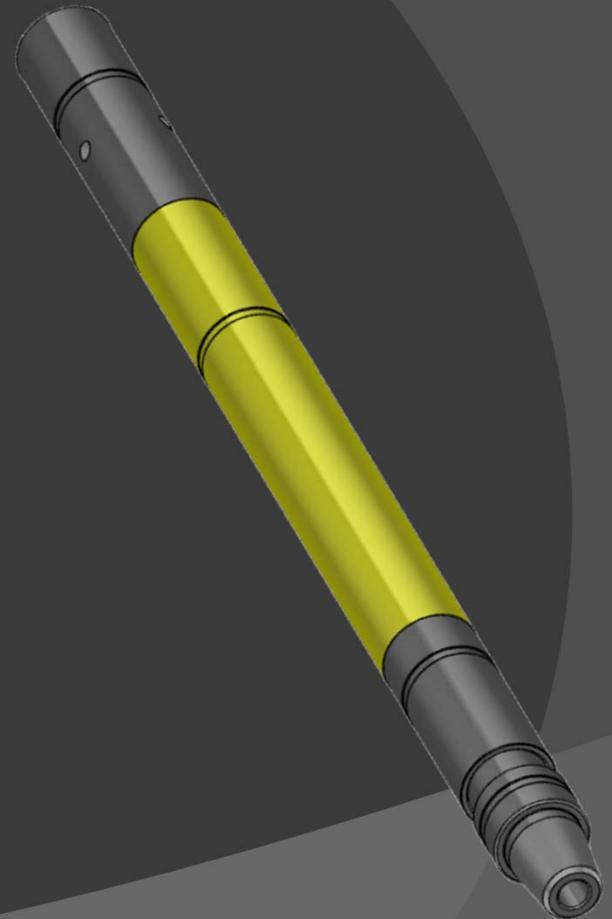
# BitSavR Development

- Operator started completing long laterals with high plug count. Many with 200+ plugs in a single well
- WOS was challenged with completing well in one run
- WOS had done extensive field tests and real world applications prior with proprietary BitSavR technology
- Complete BHA minus the bit, jars and profile subs were WOS manufactured and provided
  - JZ Borehaug tricone bit used



# Operational Plan

- ◉ Run proprietary BitSavR technology in conjunction with drillout BHA
  - The smart sub opens and closes based on the transfer of weight at the bit.
  - This allows for an indication of applied WOB on surface in order to more effectively control the amount of weight being transferred to the bit.
- ◉ WOS designed 3-1/8" POWR Motor
  - Driveshaft and rotor catches installed
  - Withstand the highest torque outputs of any of our competitors
  - All motors dyno tested before arriving on location
- ◉ 2-7/8" PH6 Tubing workstring
- ◉ Well modeled pre-job



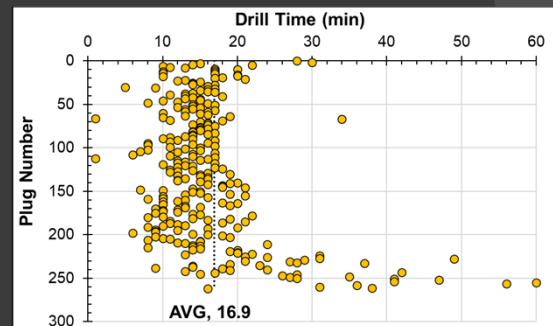
# Results and Deliverables

- ⌚ All 3 wells drilled out and TD in one run
  - Tight cluster for mill times vs. depth
  - Surface rotary torque max 3600ft/lb
  - 4.7 bpm @ 236rpm
  - Open to close time avg = 122 hours
- ⌚ Repeated success in one run
- ⌚ Post well follow up included
  - Full well analysis
  - Post run bit scans to evaluate metal loss
  - BitSavR continued on all wells for operator



# WOS Record Run – 262 Plugs

- Operator challenged WOS with a 262 plug drill out and TD in one run
  - Well TD around 24K ft
  - Pre-well modeling showed no issues getting to bottom
  - Same drillout BHA as all previous record runs
  - BitSavR set down opening weight calibrated to operator and plug provider specs
- Results
  - Well TD in a single run
  - 8 total stalls recorded
  - Average drill time per plug = ~17 min
  - Average wash time per plug = ~18 min



Well	Run Dates	Plugs Drilled	Total Drill Time (min)	Avg Drill Time per plug (min)	Total Wash Time (min)	Avg Wash Time per plug (min)	Total 'No Tags'	Total Stalls	Avg Plugs Drilled per Hr
8H	5/26-6/2	262	4428	16.9	4803	18.4	3	8	1.51

# Drill Out Record Performances

Most Plugs Drillout-Stickpipe								
Rank	Date	St	Depth Reached	TVD (ft)	Lateral Length (ft)	Plugs Drilled	Conveyance	BHA's
1	5/26/2023	PA	23,924	8,008	15,570	262	Stickpipe	1
2	11/26/2022	PA	23,671	7,840	15,352	261	Stickpipe	1
3	5/31/2023	PA	24,002	8,030	15,556	261	Stickpipe	1
4	6/2/2023	PA	23,770	8,030	15,584	259	Stickpipe	1
5	12/18/2022	PA	24,355	8,180	15,393	258	Stickpipe	1
6	11/18/2022	PA	23,673	7,847	15,298	256	Stickpipe	1
7	6/4/2023	PA	24,077	8,022	15,257	255	Stickpipe	1
8	10/1/2022	PA	24,548	8,004	16,061	241	Stickpipe	1
9	6/18/2022	PA	0	7,713	14,412	241	Stickpipe	1
10	1/13/2023	PA	22,604	8,175	14,314	236	Stickpipe	1
11	6/13/2022	PA	0	7,701	13,997	235	Stickpipe	1
12	6/1/2022	PA	0	7,687	13,423	224	Stickpipe	1

Deepest Drillout- Stickpipe								
Rank	Date	St	Depth Reached	TVD (ft)	Lateral Length (ft)	Plugs Drilled	Conveyance	BHA's
1	3/10/2023	OH	29,730	9,397	20,310	97	Stickpipe	1
2	4/14/2023	WV	29,019	7,727	20,742	112	Stickpipe	1
3	4/19/2023	OH	28,816	10,008	18,896	105	Stickpipe	1
4	10/16/2022	OH	28,350	10,189	17,876	88	Stickpipe	1
5	10/23/2022	OH	28,076	10,188	17,971	87	Stickpipe	1
6	2/27/2023	OH	27,961	9,400	20,277	88	Stickpipe	1
7	9/29/2020	PA	27,469	7,297	19,788	107	Stickpipe	1
8	3/12/2023	PA	27,385	7,414	19,364	95	Stickpipe	1
9	3/20/2023	PA	27,123	7,380	19,344	96	Stickpipe	1
10	7/16/2021	PA	27,031	7,730	17,005	93	Stickpipe	1
11	3/11/2023	PA	26,788	7,344	19,064	98	Stickpipe	1
12	10/6/2022	OH	26,766	10,184	16,445	80	Stickpipe	1

## ● Technologies aided in record performance

- BitsavR
- EaZy Drill
- POWR Motor
- WOS AV Subs
- Guardian System

Contact your local WOS  
representative or below for  
availability and pricing

[sales@workoversolutions.com](mailto:sales@workoversolutions.com)

OR

346-774-4433



# WOS Company Overview

- ⌚ Started Operations in Q3 2015
- ⌚ Fully Supported Downhole Tool Division
  - Design & Engineering
  - Machining & Fabrication
  - Field Operations
  - Rebuild & Redress
  - Evaluate Performance
- ⌚ Wireline
  - 3 trucks in the Northeast and 2 in West Texas
  - Started operations in July 2018
- ⌚ Operational Coverage
  - Pennsylvania, Ohio, West Virginia, and New York
  - Texas, New Mexico
  - North Dakota, Wyoming
  - Louisiana



# WOS Locations

