

CORVA

The Future of Oil & Gas

Making the Case for Automation: Real-Time Hydraulics Modeling

February 18, 2021



Agenda

Corva Overview

Corva Hydraulics

- Physics-Based Models
- Static Model Inputs
- Dynamic Model Inputs
- Summary

Case Study

- Mud Report vs. Densitometer-Measured Mud Density Model

Future Automation Integration



Corva Overview



People

REAL Hands-On
Industry Experience



Process

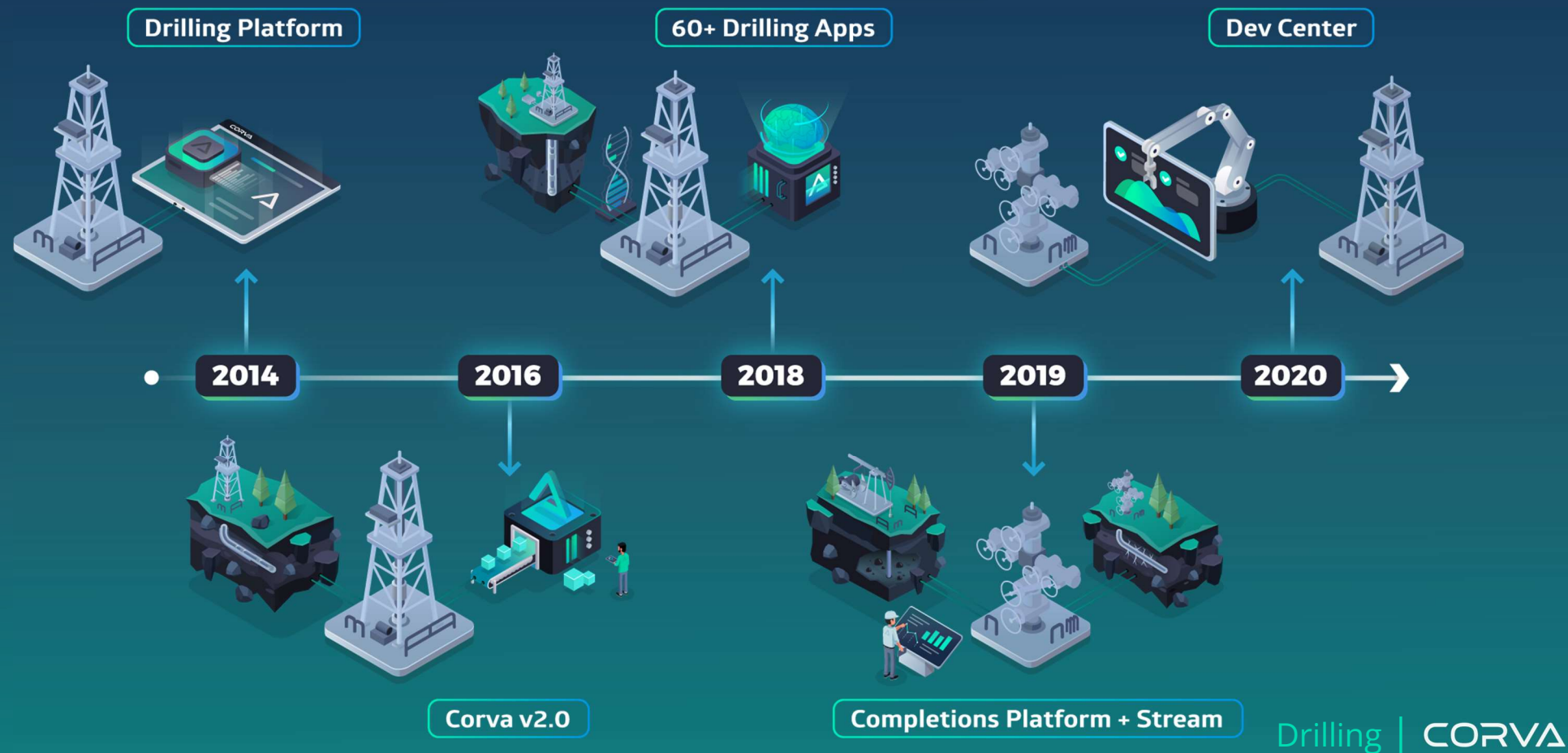
24/7 Houston-Based
Operating Center



Technology

Custom-Built
Optimization Apps

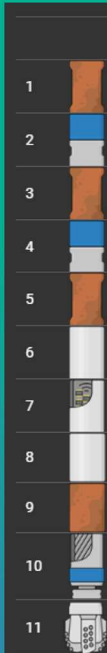
Corva Overview



Corva Hydraulics – Static Model Inputs

- Corva references the following inputs to feed into models
 - Mud Properties
 - Surface components
 - Tubulars
 - Tool joints
 - BHA details
 - Specialty tools
 - Bit jets
 - Reamer jets
 - Casing design
 - Wellbore geometry

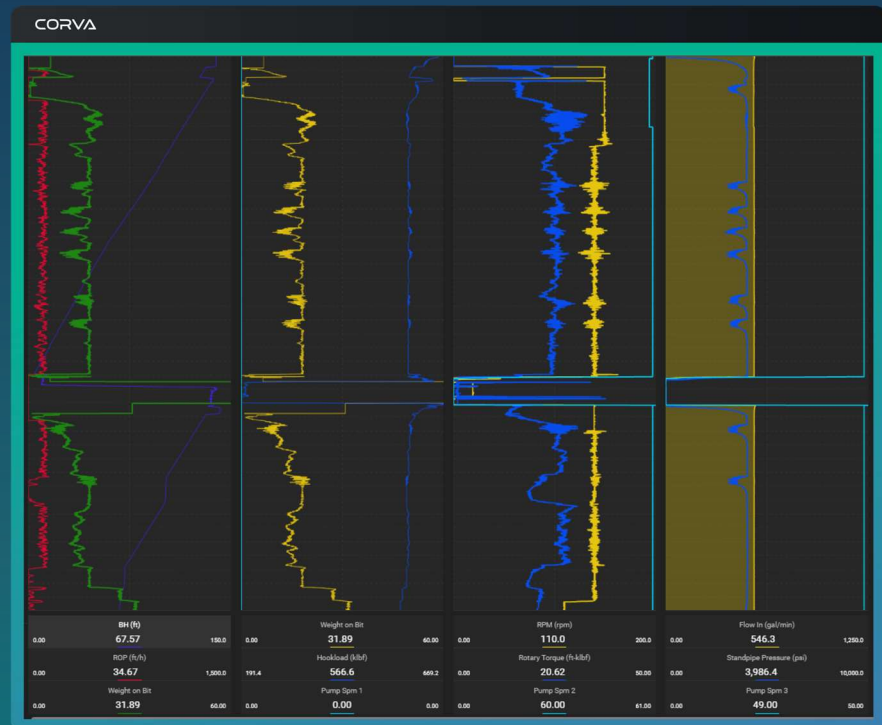
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	Category	Name	OD (in)	ID (in)	Linear Weight (lb/ft)	Length (ft)
1	dp	5"DP(4.5" IF)	5	4.276	21	31
2	agitator	Agitator	6.5	3.438	81.34	18.34
3	dp	5"DP(4.5" IF)	5	4.276	21	3781.29
4	agitator	Agitator	6.5	2.688	93.621	20.49
5	dp	5"DP(4.5" IF)	5	4.276	21	1889.72
6	dc	NMDC	6.75	3.25	93.555	30.13
7	mwd	NMDC	6.875	3.25	98.107	30.99
8	sub	UBHO	6.5	2.813	91.783	4
9	sub	Float Sub	6.5	2.813	91.783	3.15
10	pdm	7" QES 5/6 8.4	7	3.5	98.233	33.75
11	bit	8.5" Taurex TSd616	8.5			1

Corva Hydraulics – Dynamic Model Inputs

- Corva ingests live parameters from WITSML
 - Mud density
 - ROP
 - Flow rate
 - PDM differential pressure (Zeroing)
 - Standpipe pressure
 - PWD Annular Pressure & ECD
 - MPD backpressure



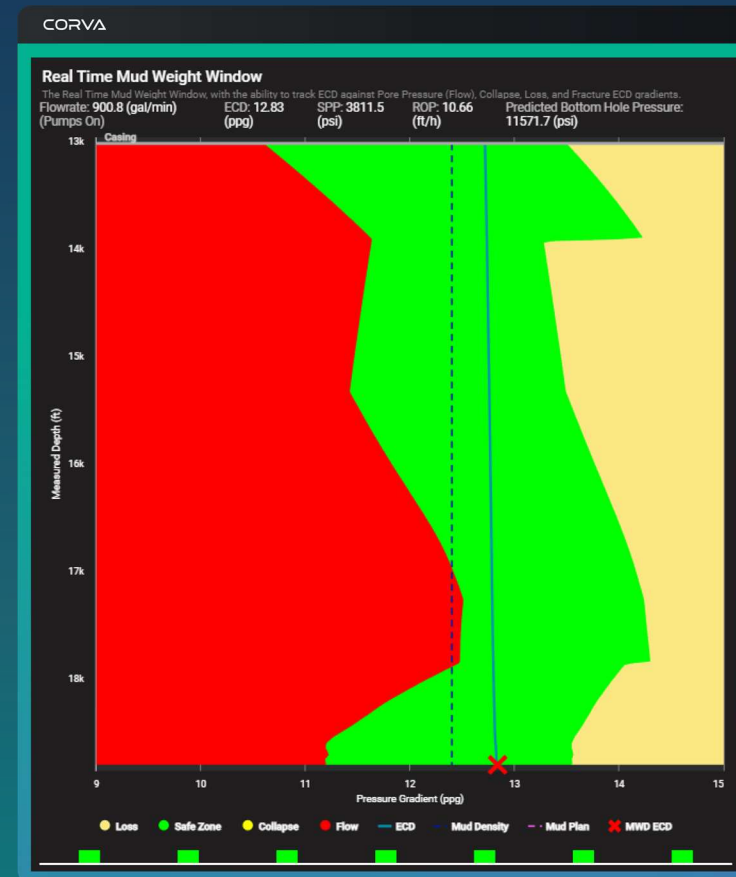
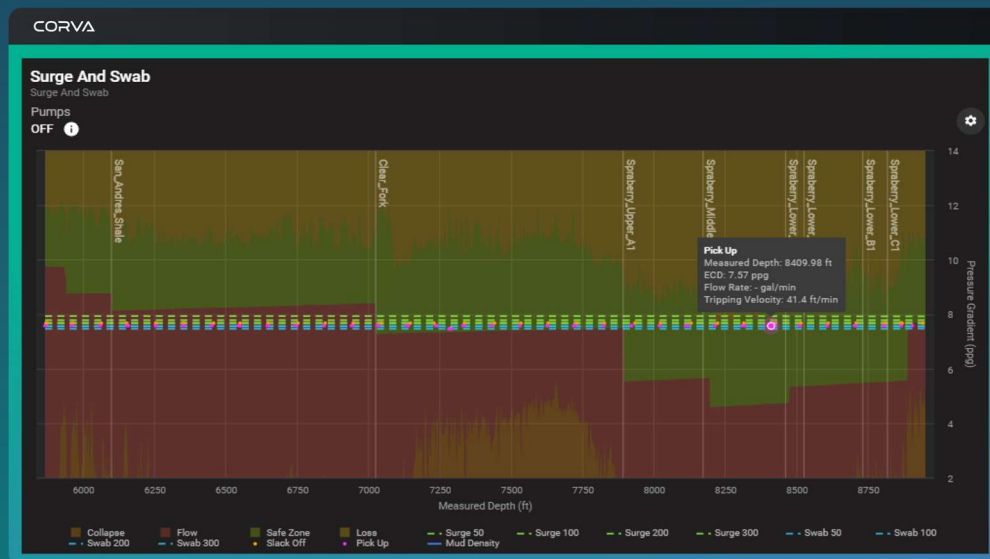
Corva Hydraulics – Automated in Real-Time

- Corva calibrates hydraulics model at the start of drilling

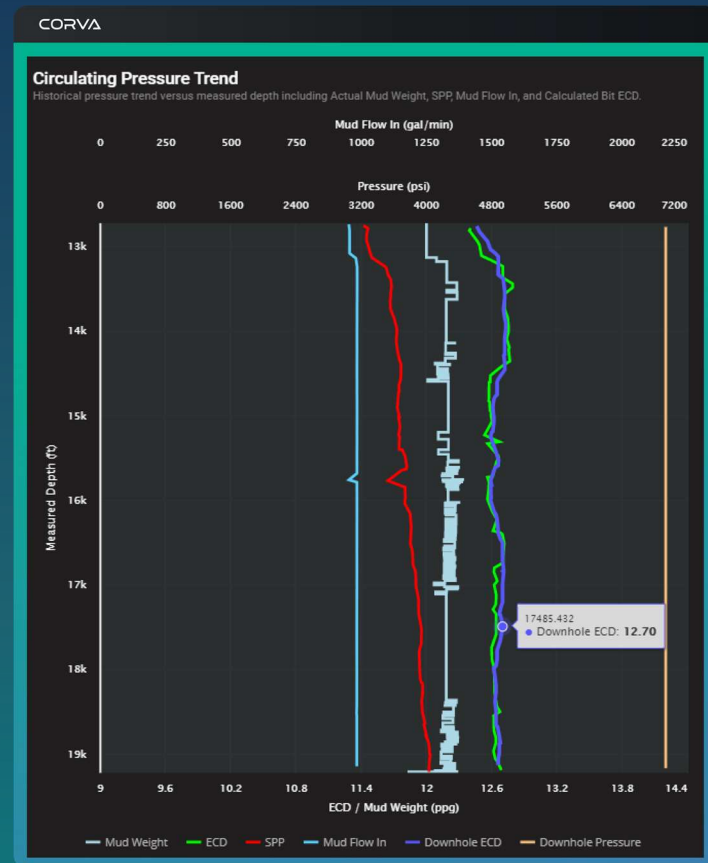
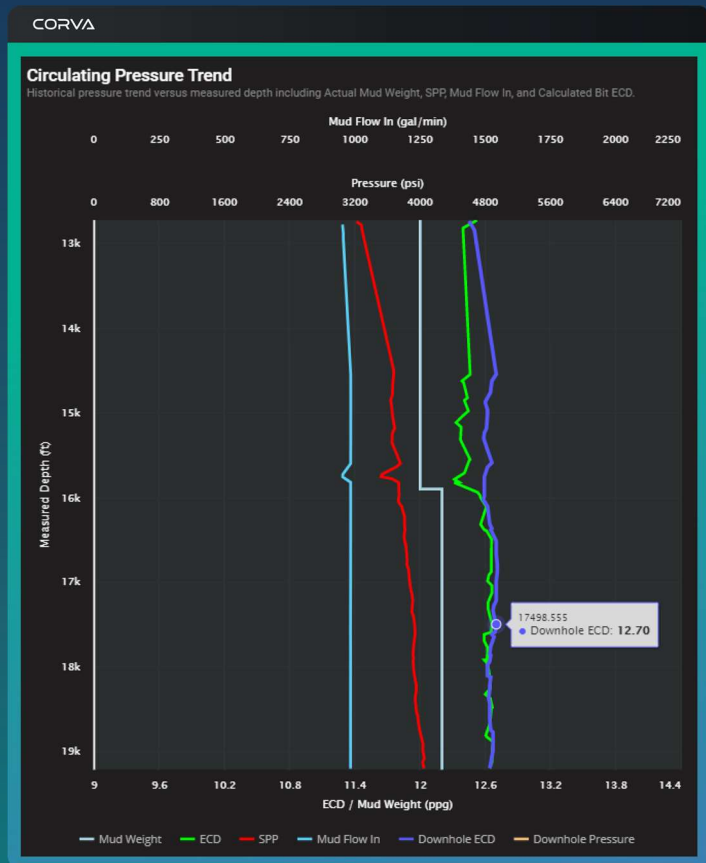


Corva Hydraulics – Summary

- Corva combines physics-based models, with maintained static, and dynamic inputs to produce function-specific apps
 - Decisions over data



Case Study – Mud Report vs. Densitometer



Future Automation Integration

- Plug and play design of platform
- More frequent Fann readings and fluid measurements
- More Fann readings reported
- Input more data into EDR -> WITSML
 - More accurate fluid regime
 - Better operational decisions can be made in the field
 - Stuck pipe prevention



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Thank You!

