



2022 GAS LIFT WORKSHOP

Gas Lift in Unconventionals Is Gas Lift Optimization in real-time possible?

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ALRDC Gas Lift Workshop
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Agenda

- Vista overview
- Introduction - Vision
- Real Time Surveillance & Remote Operated Field
- Frac Hit management with Gas Lift
- Gas Lift Field Optimization
 - Early Troubleshooting Detection
 - Optimized wax deposition control
 - Slickline management
 - Gas Lift Optimization - “the conventional way”
- Intelligent Field Pilot Project
- Wrap Up

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Vista overview

- Robust production growth Plan

Successfully tied-in 46 new shale oil Wells in Bajada del Palo Oeste, from an inventory of 850 locations.

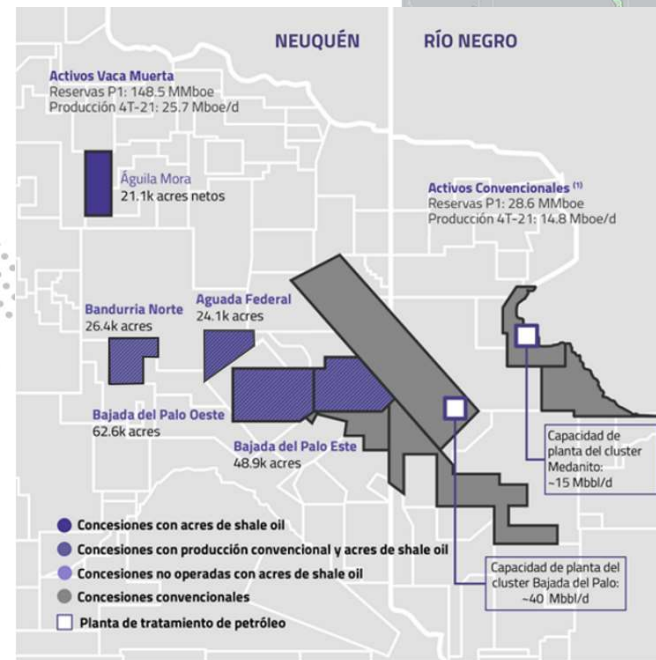
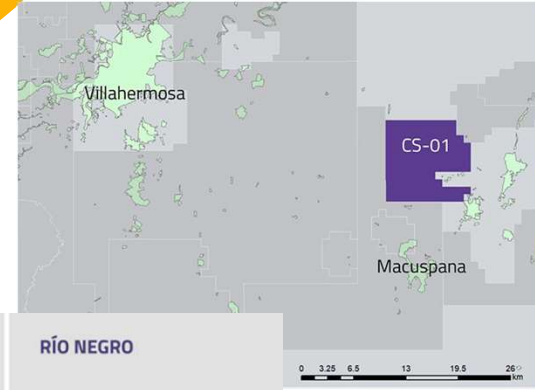
Concessions with 35-year terms covering more than 183 k acres.



CIUDAD DE MEXICO, MEXICO



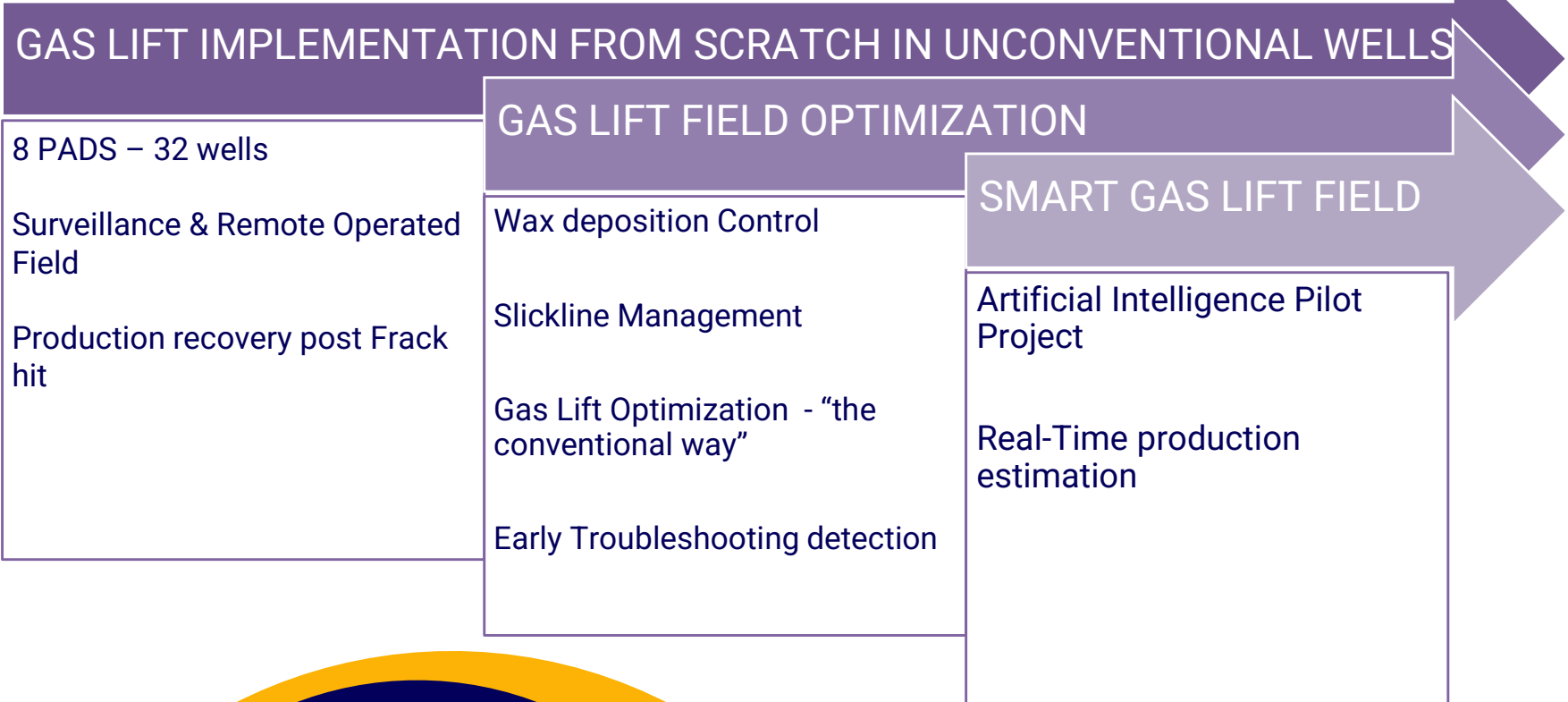
NEUQUÉN, ARGENTINA



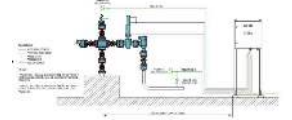


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Introduction - Vision

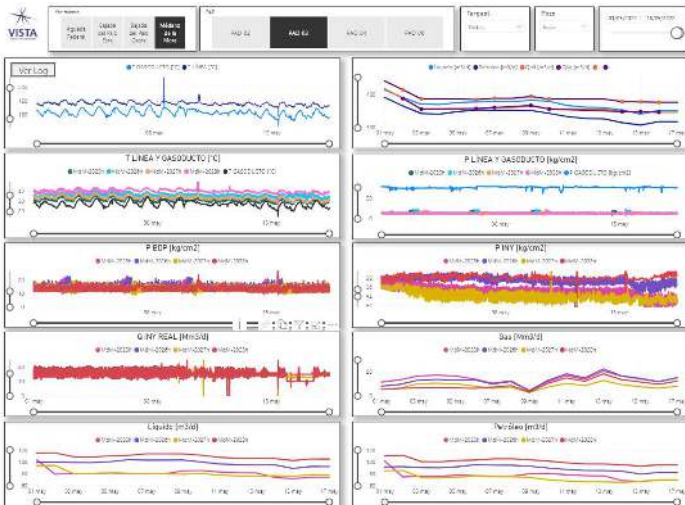


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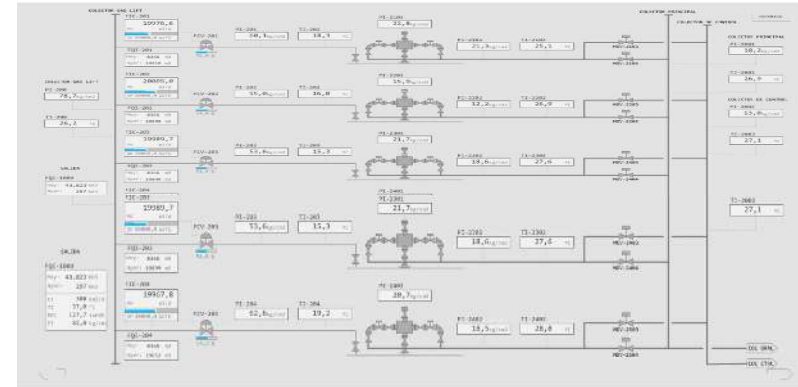


Real Time Surveillance & Remote Operated

IoT SCADA



REAL TIME DASHBOARDS



FIELD ASSISTANT REMOTE OPERATION

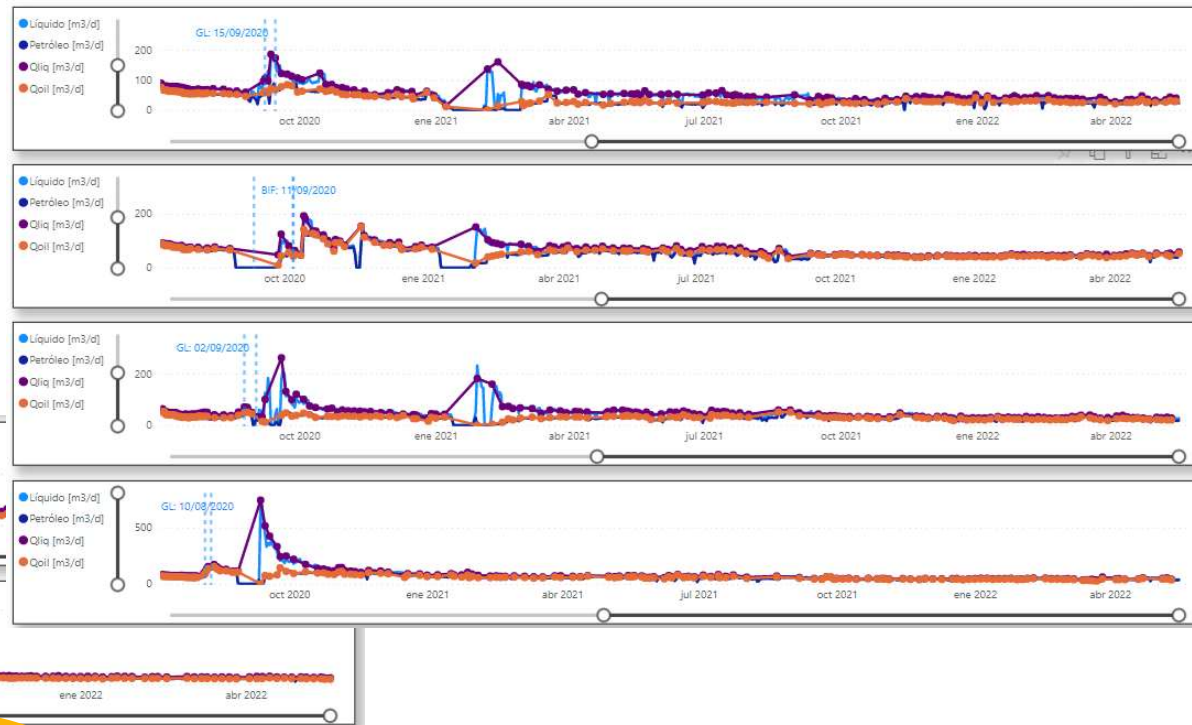


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Frac Hit management with Gas Lift

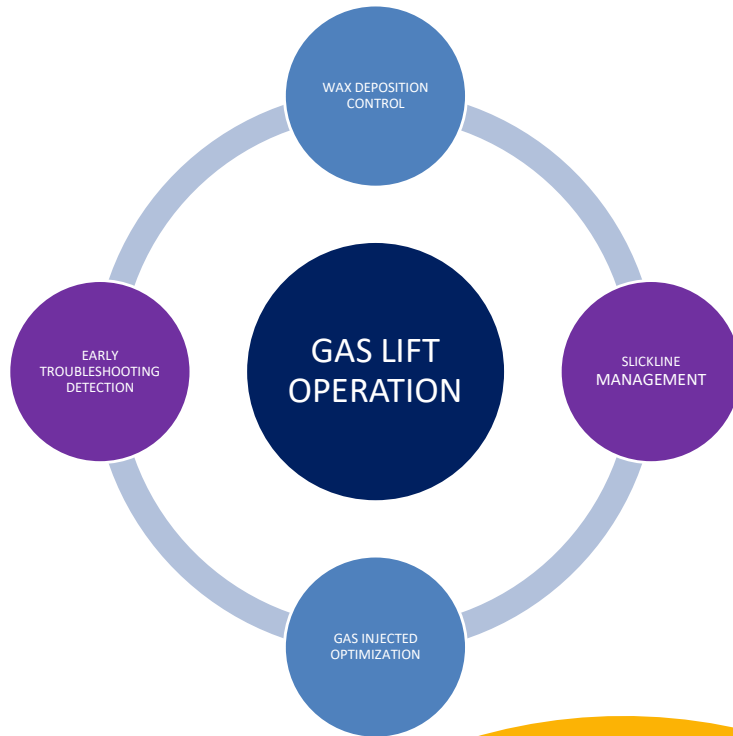
- Surface safety valves allow the well to be kept producing without shut-in.
- Liquid rate is not limited.
- Most wells recover oil production in a short period of time.





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Gas Lift Field Optimization



WAX DEPOSITION CONTROL

- PREVENTION
 - CHEMICAL -VIA GAS LIFT / VIA CAPILAR
 - THERMIC -IN WELL / OUTSIDE WELL
 - NEW TECHNOLOGIES
- MITIGACION
 - CHEMICAL -VIA GAS LIFT / VIA CAPILAR
 - THERMIC
 - MECHANICAL

GAS INJECTED OPTIMIZATION

- OPTIMIZACION PERFORMANCE CURVE
- SURFACTANTS - VIA CAPILAR STRING / VIA GAS LIFT
- EARLY INTERMITENT GAS LIFT
- ADVANCED ANALYTICS
 - MACHINE LEARNING / ARTIFICIAL INTELLIGENCE

SLICKLINE INTERVENTIONS

- SLICKLESS GAS LIFT TROUBLESHOOTING
 - GAS LIFT ECHOMETRY
- FASTER SLICKLINE UNIT
- IPO VALVES INSTEAD OF DUMMY VALVES
- STRATEGIC PROGRAMMING

EARLY TROUBLESHOOTING DETECTION

- SLICKLESS GAS LIFT TROUBLESHOOTING
 - GAS LIFT ECHOMETRY
- BASIC ANALYTICS
 - REAL TIME DASHBOARDS
- ADVANCED ANALYTICS
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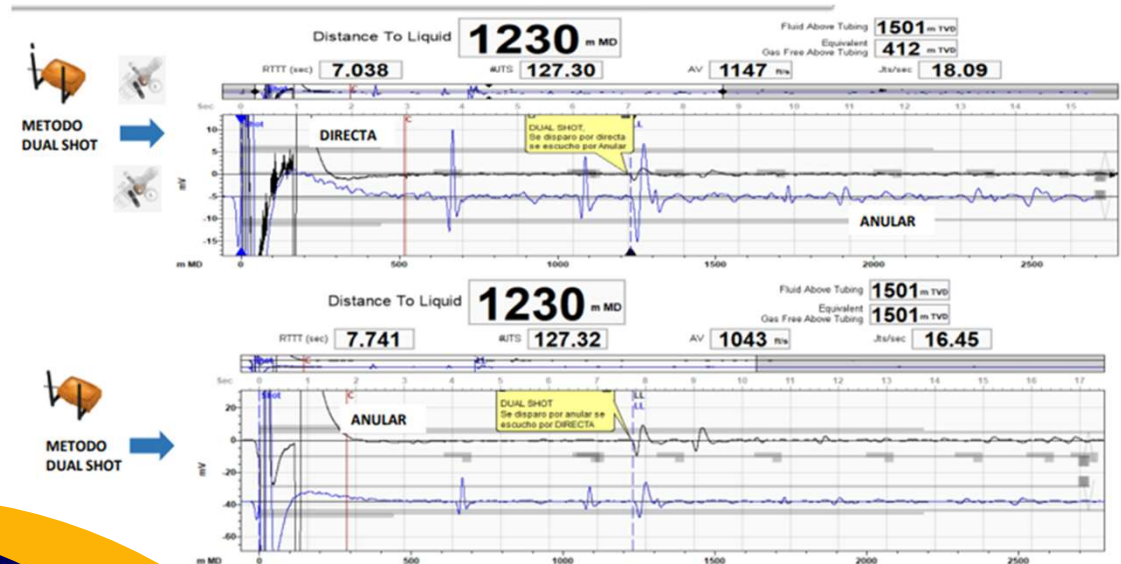
Early Troubleshooting detection

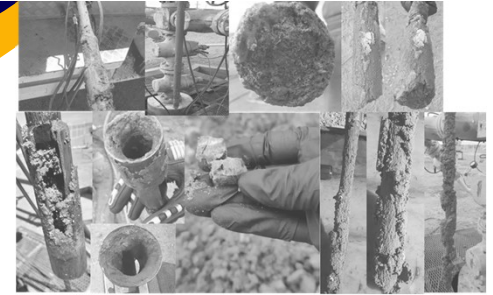
- Real Time Dashboard alarms



- Conventional Slickline Pressure & Temperature surveys for diagnosis
 - Dual shot Echometer methodology implemented

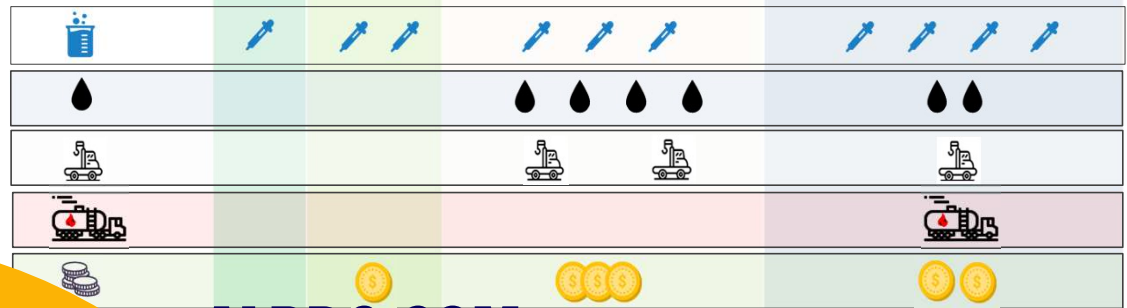
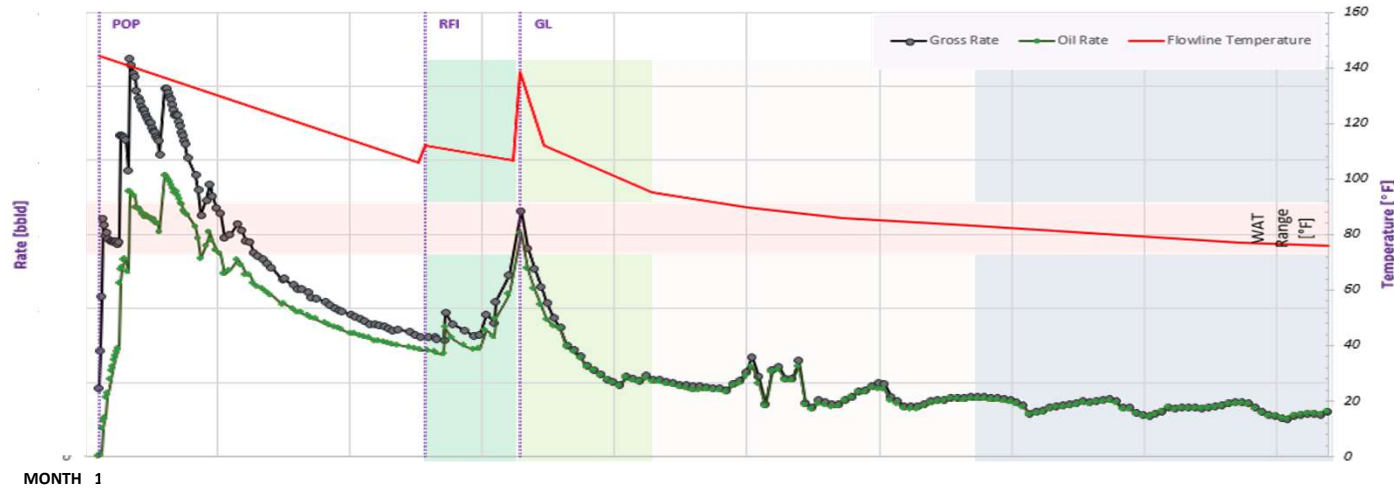
Syptom	Casing could not increase pressure.
Troubleshooting	Casing-Tubing Communication detected.
Solution	Gas Lift valve changed & Casing pressure increased.





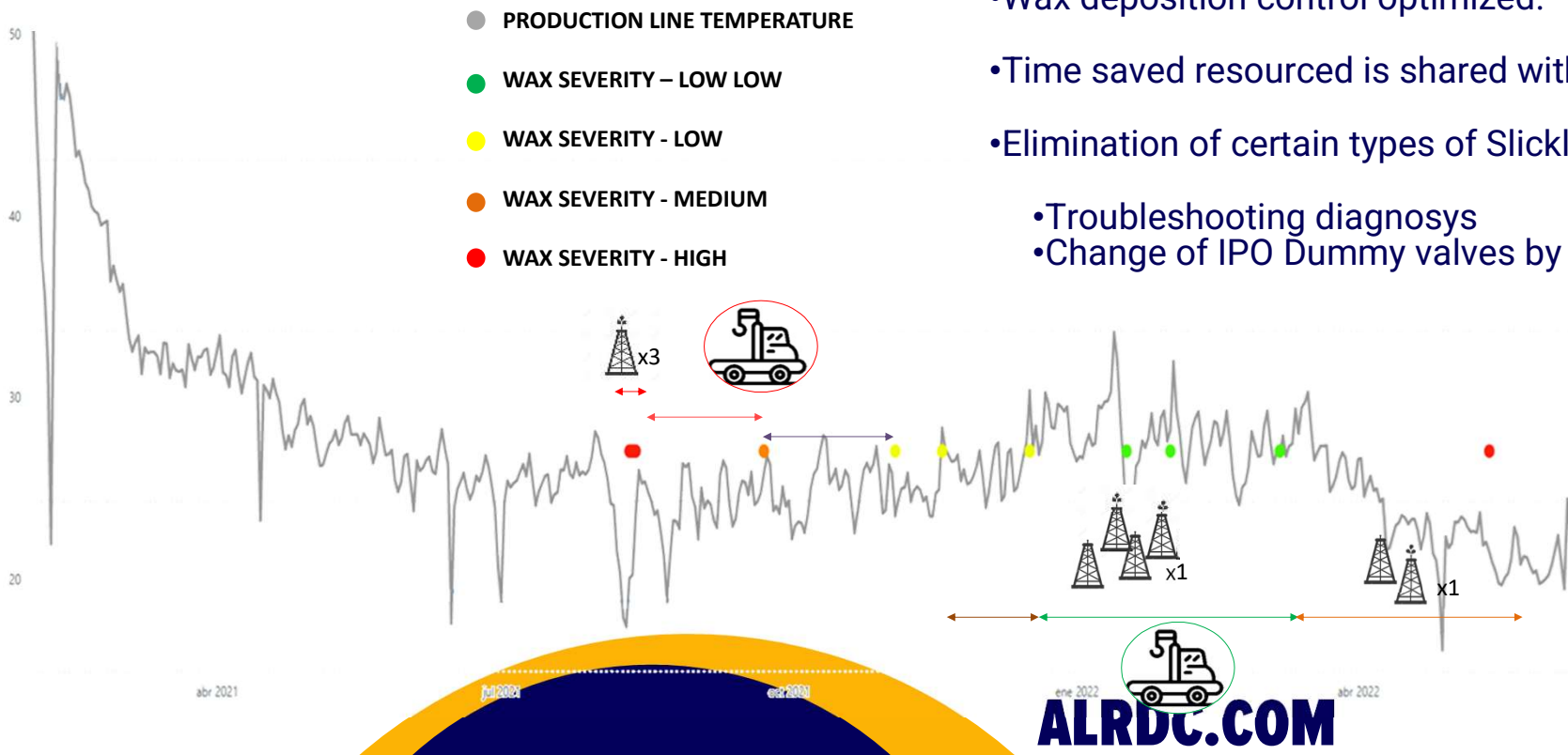
Optimized wax deposition control

- Chemical/Mechanical/Thermic Treatment.
 - Chemical capillary/via gas lift injection.
 - Slickline mechanical removal.
 - Thermic - Hot Water injection.



Best cost-performance ratio for each stage of well life.

Slickline management



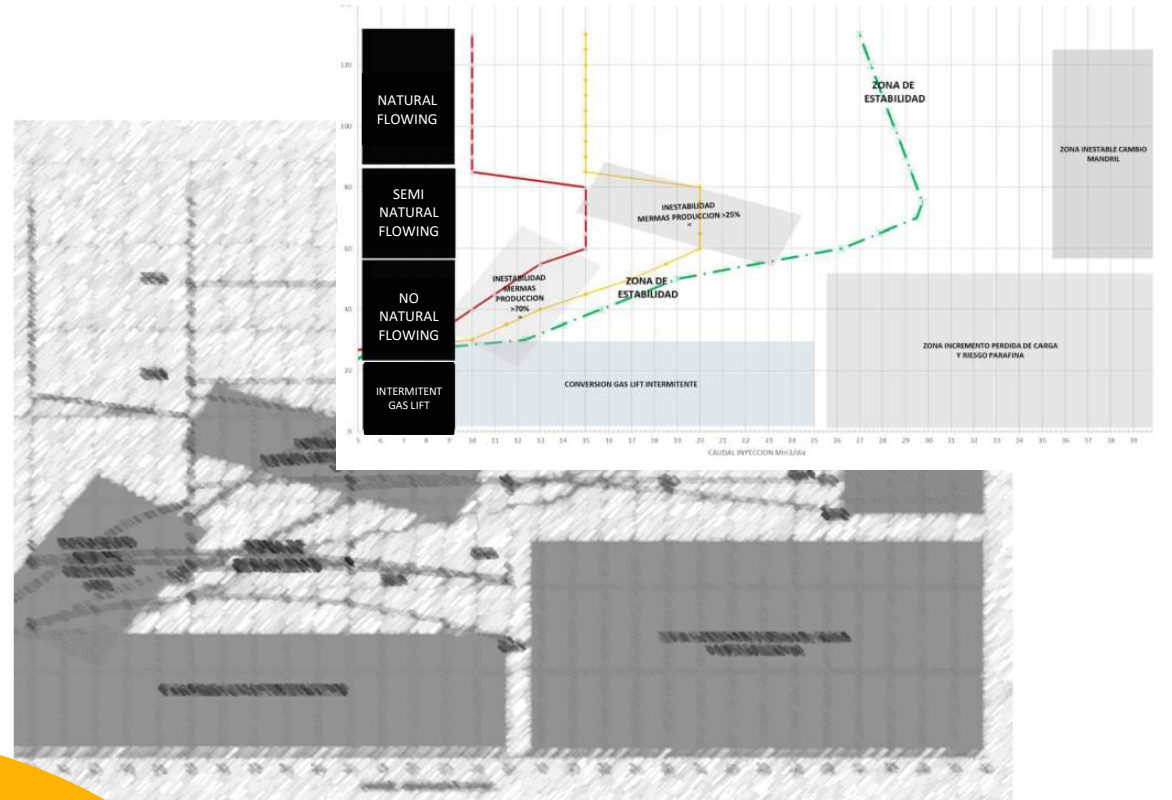
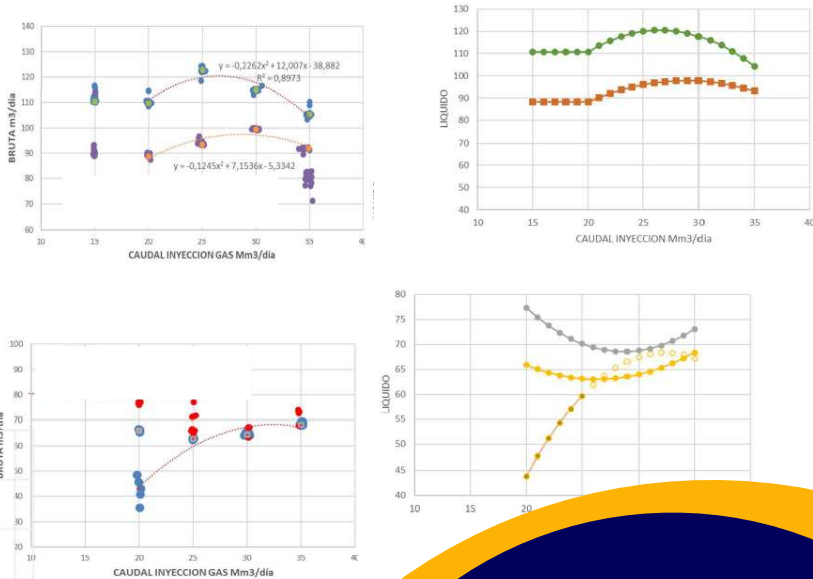
- Faster slickline unit
- Strategic Slickline Programming
- Wax deposition control optimized.
- Time saved resourced is shared with Rig Interventions
- Elimination of certain types of Slickline Interventions
 - Troubleshooting diagnosis
 - Change of IPO Dummy valves by IPO

Gas Lift Optimization - "the conventional way"

High PI wells.

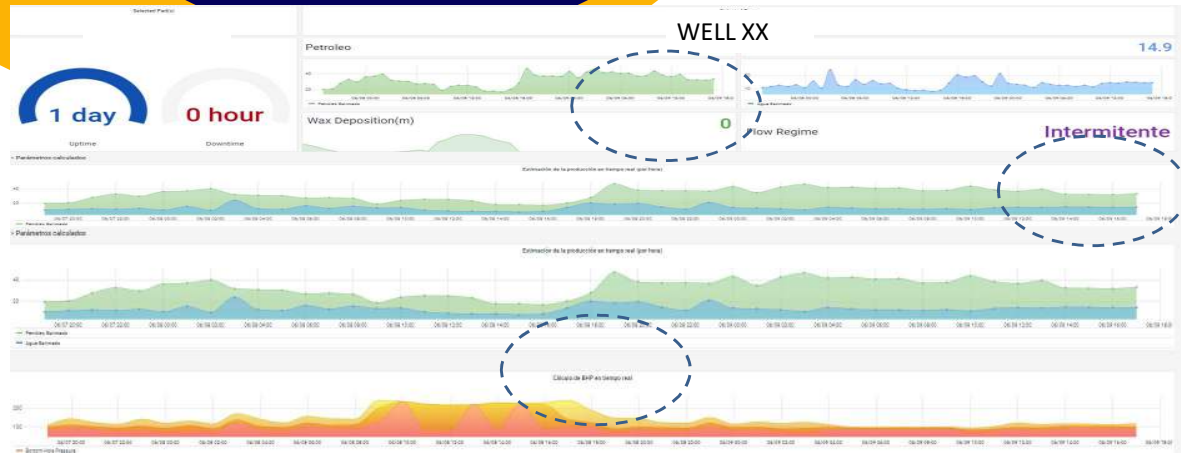
Unloading takes more than a year.

It's a guide but rapidly changes.



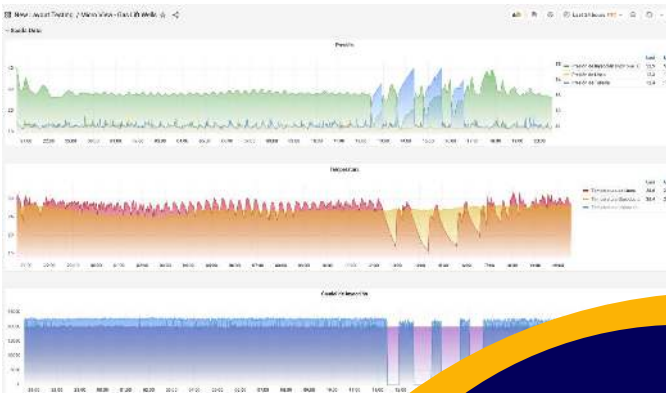
Intelligent Field Pilot Project

- AI-based model built
 - Virtual Flow Metering
 - Real-Time Multiphase Flow Simulator
 - Gas Lift Optimization Model
 - Anomalous Event Detection and Real-Time Alerting
 - Paraffin Deposition Model

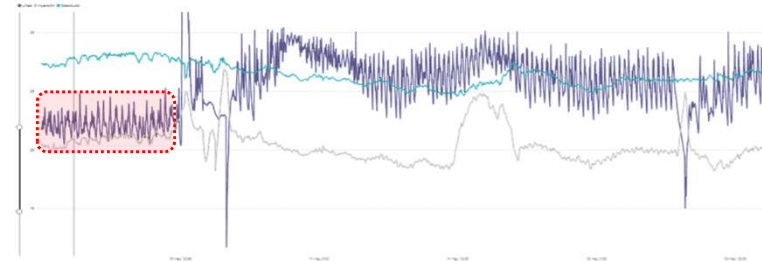
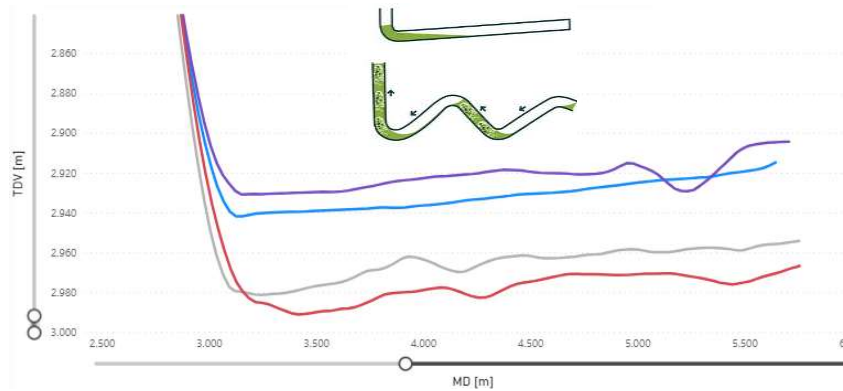


All Pads		Pad 2, Pad 4, Pad 6	
Agua Total	Petróleo Total	Agua Total	Petróleo Total
484	114	484	114

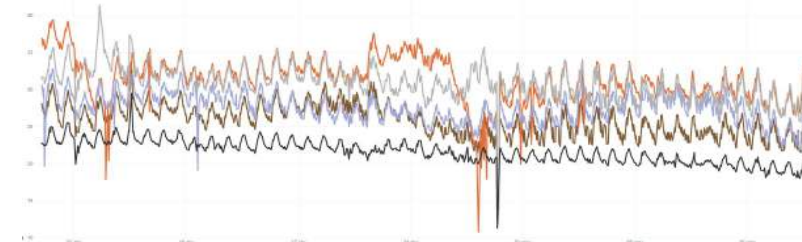
Pad	Parafina (M3/D)	Agua (M3/D)	Inyección de Aire (M3/D)	Clasificación de la producción	Inyección de Aire (M3/D)	Clasificación de la producción	Regime	Wax Deposition and Status (m)	SWP (M3/D)
WELLXX	25.4	11.9	21942	Intermittente	1761	Intermittente	Intermittente	200	112
WELLYY	11.3	3.07	22711	Intermittente	2722	Intermittente	Intermittente	0	54.8
WELLVV	25.6	9.08	19768	Intermittente	2587	Intermittente	Intermittente	0	34.8
WELLM	25.5	12.8	22176	Intermittente	2498	Intermittente	Intermittente	0	55.2
	48.9	14.8	24277	Intermittente	2246	Intermittente	Intermittente	0	55.2
	25.6	10.8	22497	Intermittente	2392	Intermittente	Intermittente	0	43.1
	47.8	5.01	23327	Intermittente	2782	Intermittente	Intermittente	0	35.1
	41.6	6.11	23327	Intermittente	2326	Intermittente	Intermittente	0	55.1
	48.9	6.12	22156	Intermittente	2492	Intermittente	Intermittente	0	55.1
	43.2	8.05	18251	Intermittente	2492	Intermittente	Intermittente	0	55.1



Production behaviours



Terrain Slugging detected.





Wrap Up

- ✓ We believe that to optimize an unconventional gas lift operation, the field should be fully instrumented and monitored.
- ✓ Conventional gas lift performance curves give a global view of the response of wells throughout the well life stages.
- ✓ Given the complexity of the Unconventional Horizontal Wells, the use of Artificial Intelligence is necessary.
- ✓ Finally, the behavior of the production of unconventional wells must be studied and shared to have a better understanding from the operational point of view.



Acknowledgements/Thanks

To my colleagues from the Vista team who from the beginning showed a total Commitment in the success of the project.

Questions?

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