

# PRODUCTION LOGGING TOOLS



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# GR, CCL, Temp, Pressure tool



- Tool is dual mode (SRO and memory) comes with built-in electronics, battery & memory allowing shorter tool string
- Battery capacity 10 Ah for over 100 hrs of acquisition
- Top & bottom connection for ILS / CFS / FBS subs powered up & controlled from the module
- Exposed Temp probe



# Full-bore Spinner Flowmeter tool



- FBS mechanical sub to be connected to main module (GR, CCL, T, P)
- Advanced sensitivity to flow (from 5 bpd)
- Flow rate range from 5-7,550 bpd
- (1-1,200 m<sup>3</sup>/d)
- Bottom connection to HRT tool



# ILS Spinner Flowmeter tool



- ILS mechanical sub to be connected to main module (GR, CCL, T, P)
- Advanced sensitivity to flow
- Flow rate range from 19-15,860 bpd (3-2,521 m<sup>3</sup>/d)
- Can be made autonomous



# CFS Spinner Flowmeter tool



- CFS mechanical sub to be connected to main module (GR, CCL, T, P)
- Advanced sensitivity to flow
- Flow rate range from 19-15,860 bpd (3-2,521 m<sup>3</sup>/d)
- Can be made autonomous



# Fluid Phases Evaluation tool



- Accurate fluid phases measurement in production wells
- Water-oil producing intervals identification
- Water breakthrough determination based on resistivity (salinity) measurement
- Autonomous or SRO tool with built-in electronics, memory, battery



# Compact MPLT tool



- Six-in-one (GR, CCL, T, P, CFS, WHU) fully autonomous tool
- Production-injection profiles evaluation
- Performance evaluation of complex well completions with SSDs
- Cost-effective solution for small service companies



# High-Resolution Temperature tool



- High-resolution temperature measurement
- Input to T-Flow temperature modeling software for production-injection profile calculation
- Flow behind casing quantitative evaluation
- Autonomous or SRO tool with built-in electronics, memory, battery





# Fluid Identification Noise Detection tool



- Three sensors with split channels architecture of noise detection
- Well integrity evaluation (tubing/casing leaks, completion elements leaks, etc.), reservoir performance, flow behind casing
- Advanced sensitivity to flow of 0.05 PSI differential pressure at 33 ml/min rate
- Autonomous or SRO tool with built-in electronics, memory, battery for 100hrs



# Thermal Flow tool



- Quantitative injection-production profile evaluation
- Replacement of spinner in tough well-fluid conditions
- Minimum detectable fluid velocity 1.4 ft/min (0.4 m/min)
- Autonomous or SRO tool with built-in electronics, memory, battery for 70hrs



# 3 Barrier Corrosion tool MBTT



- Quantitative evaluation of metal loss up to 3 tubulars, P, T sensors built-in
- Localization of holes, cracks, parted casings
- Minimum detectable hole size 0.6”
- Autonomous or SRO tool with built-in electronics, memory, battery for 50hrs



# 4 Barrier Corrosion tool MBTT



- Quantitative evaluation of metal loss of 4<sup>th</sup> tubular
- Localization of holes, cracks, parted casing
- Minimum detectable hole size 1.5”
- Autonomous or SRO tool with built-in electronics, memory, battery for 50hrs



# Segmented Corrosion tool



- Eight sectors segmented high-resolution EM evaluation of the well tubular up to 7”
- Internal & external corrosion evaluation and monitoring
- Minimum detectable hole size 0.3”
- Autonomous tool with built-in electronics, memory, battery for 50hrs



# Cement Bond tool



- Cement bond quality evaluation (internal/external contacts)
- Acoustic profile in open hole wells
- Autonomous or SRO tool with built-in electronics, memory, battery sub for 24hrs



2.4" tool



3" tool

# Acoustic Caliper Array tool



- Internal and external well tubular inspection with a high level of detalization
- Corrosion evaluation and monitoring of well's tubulars, fractures and vugs evaluation in OH
- Minimum detectable hole size 0.7mm (0.03")
- Autonomous tool with built-in electronics, memory, battery for 45hrs



# Segmented Cement Bond tool



- Segmented cement bond quality evaluation (internal/external contacts)
- Eight sectors accurate cement bond integrity to casing / formation
- Autonomous or SRO tool with built-in electronics, memory, battery for 24hrs





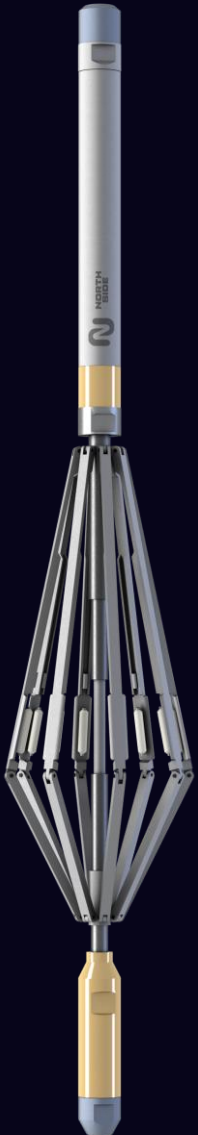
# Spinner Array tool



- Production flow profiling in highly deviated or horizontal trajectories with segregated flow regimes
- Four sensitive spinners on rigid arms
- Detectable flowrates range 20-15,000 bpd
- Autonomous tool with built-in electronics, memory, battery for 100hrs



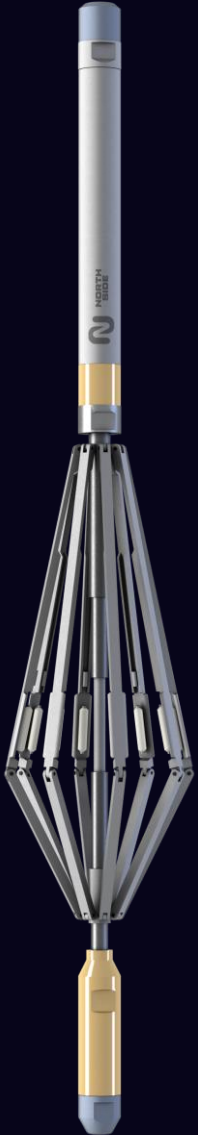
# Capacitance-Temperature Array tool



- Highly deviated or horizontal trajectories with
- segregated flow regimes
- Cross-sectional water hold-up profile determination
- Segmented production profile evaluation based on distributed HRT sensors and temperature modeling
- Autonomous tool with built-in electronics, memory, battery for 100hrs



# Capacitance-Resistivity Array tool



- Highly deviated or horizontal trajectories with
- segregated flow regimes
- Cross-sectional water hold-up profile determination
- Water breakthrough determination based on resistivity (salinity) measurements
- Autonomous tool with built-in electronics, memory, battery for 100hrs



# Why North Side's PL Tools?

- Cost-effective tools & parts
- Robust design, high accuracy measurements – we do logging by our tools with 100% success rate in different types of the wells
- Advanced data processing and interpretation support by inhouse software & qualified data analysts
- 24/7 technical support
- We are trusted by:



and more

