

Borehole Seismic Services

DOWNHOLE TOOLS

Halliburton Borehole Seismic Services (BHS) provides customized, reliable, high-resolution solutions that bridge the gap between surface seismic and the wellbore to improve reservoir analysis.

THE COMPLETE PACKAGE

Halliburton uses the latest technology in data acquisition coupled with advanced VSP software to provide quality images of the borehole and its vicinity. From presurvey plan design to data acquisition, processing and interpretation, our fully trained professionals work with you from start to finish to optimize the value on every project.

Using industry-leading borehole seismic downhole array tools and dedicated experts, we provide operators with improved data quality while minimizing rig time. Advanced receiver technology is crucial toward obtaining a more accurate and comprehensive geological picture of the well, field, or reservoir. For both normal and high-pressure/high-temperature environments, we deliver reliable, high-resolution borehole seismic solutions.

SEISMIC RECORDING SYSTEM

BHS uses Avalon Sciences and Sercel PC-based systems that provide digital and analog recording with full QC capabilities, and a source interface with various source controllers. This technology helps ensure optimization of sources and frequency bandwidth, and enables users to monitor S/N ratio and first-arrival picks with critical velocity data on a shot-by-shot basis across all downhole components to ensure consistent quality data. GPS time stamping on data records allows synchronization with multiple recording systems. On-site quick-look seismic processing software is optimized for borehole seismic data-generated QC displays and preliminary processed results during or shortly after data acquisition.

BHS DOWNHOLE TOOLS

Halliburton BHS downhole tools are designed for use in open and cased holes using 7-conductor wireline. All tools are 3-component with various options of gimbal, and fixed packages in single-, dual- and quad-receiver package configurations with a high locking-force-to-weight ratio. The quad-pack receiver's increased fidelity and signal-to-noise ratio provide higher resolution and better data quality. BHS tools can be deployed via wireline, pumpdown, tool-pusher logging (TPL) and on tractors.



Geochain™ Array

HAL121432



MaxiWave® Array

HAL121433

All tool systems can record at sample rates from 1/4 to 4 ms, and provide excellent broadband data quality with high S/N ratio. The downhole tools are available in the standard 3-in. or slim 1¹¹/₁₆-in. (76-mm or 43-mm) diameters. The tools are anchored decentralized for the best possible acoustic coupling with the formation using a high locking-force-to-weight ratio mechanical locking arm.

Our Avalon systems can be used in either analog or digital mode, in wells from 3 in. to 22 in. (76 mm to 559 mm) in diameter. In analog mode, we can operate in wellbore temperatures up to 435°F (224°C), and in digital mode with the Geochain™ system, we can deploy up to 60 tools at 385°F (196°C) and 30,000 psi (207 MPa).

The Avalon High Side Indicator (HSI) is the latest advancement giving continuous readout of tool roll and inclination.

Optional aligned rigid interconnects can be used between multiple tools to allow a single gyro azimuth reading to be applied to all receivers in the tool string.

Our Sercel MaxiWave® system has up to 100 digital downhole tools, and is designed for very large Walkaway and 3D VSP surveys. The MaxiWave® system is the most efficient solution to address the challenge of cost-effective acquisition of high-volume, quality data in the shortest possible time.

Tool Specifications

Tool Array	Maximum Number of Sondes	Length in. (mm)	Diameter in. (mm)	Maximum Pressure psi (MPa)	Maximum Temperature °F (°C)	Weight lb (kg)
ASR-HP	2	35 (889)	3 (76)	25,000 (172)	400 (204)	38 (17.2)
Geochain™ 60	60	35 (889)	3 (76)	25,000 (172)	356 (180)	38 (17.2)
GeochainX™ 60	60	35 (889)	3 (76)	25,000 (172)	385 (195)	38 (17.2)
ASR-EHT	2	35 (889)	3 (76)	25,000 (172)	435 (224)	38 (17.2)
GeochainSlim™ 100	100	45 (1,143)	1 ¹¹ / ₁₆ (43)	20,000 (138)	356 (180)	10 (4.5)
ASR-EHP	2	35 (889)	3 ¹ / ₄ (83)	30,000 (297)	400 (204)	51 (23.1)
Geochain™ EHP 60	60	35 (889)	3 ¹ / ₄ (83)	30,000 (297)	356 (180)	51 (23.1)
GeochainX™ EHP 60	60	35 (889)	3 ¹ / ₄ (83)	30,000 (297)	385 (195)	51 (23.1)
ASR-EHT-EHP	2	35 (889)	3 ¹ / ₄ (83)	30,000 (297)	435 (224)	51 (23.1)
MaxiWave®	100	17 (432)	3 ¹ / ₂ (89)	17,400 (120)	275 (135)	17.6 (8.0)

Geochain™, GeochainSlim™ and GeochainX™ are trademarks of Avalon Sciences Ltd. MaxiWave® is a registered trademark of Sercel.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com/bhs

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