



Geo-Vista

Vertical Seismic Profile (PIVSP) & Microseismic Monitor

PI Vertical Seismic Profile System (PIVSP)

Slim Vertical Seismic Profile Tool (SlimVSP)

Magnetic Vertical Seismic Profile Tool (MagnetVSP)

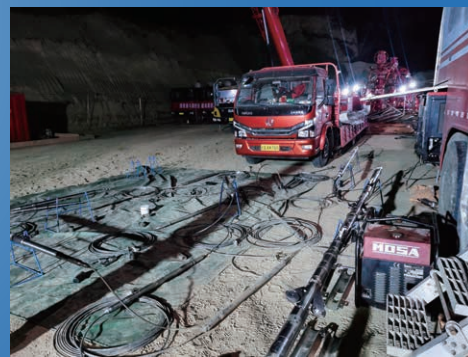
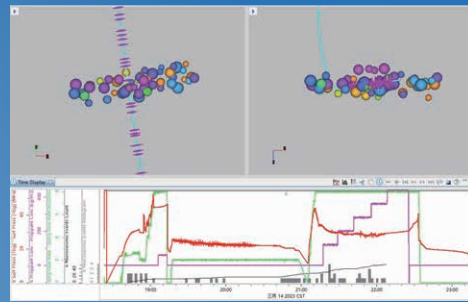
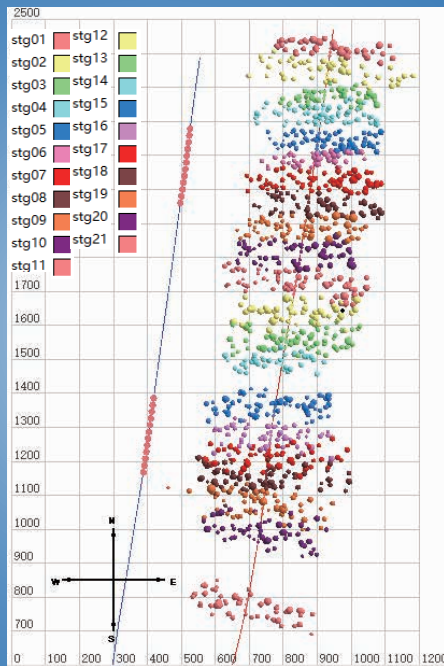
High Temperature/High Pressure Vertical Seismic Profile Tool (HTPVSP)

Thermostatic Regulation Vertical Seismic Profile Tool (TRVSP)

Multilevel Vertical Seismic Profile Tool (MultiVSP)

Geophysics Vertical Seismic Profile Tool (GeoVSP)

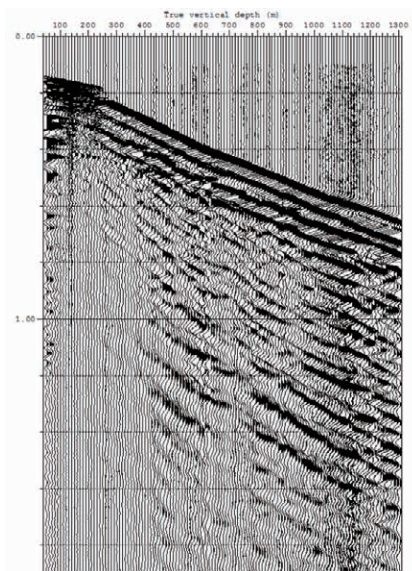
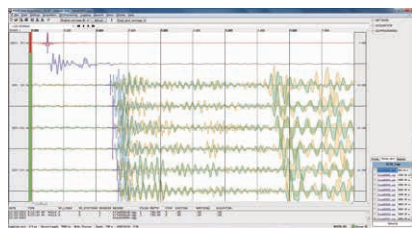
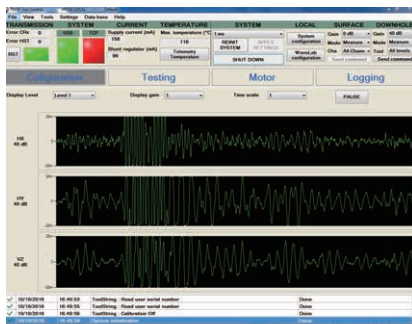
Piezoelectric Vertical Seismic Profile Tool (PiezoVSP)



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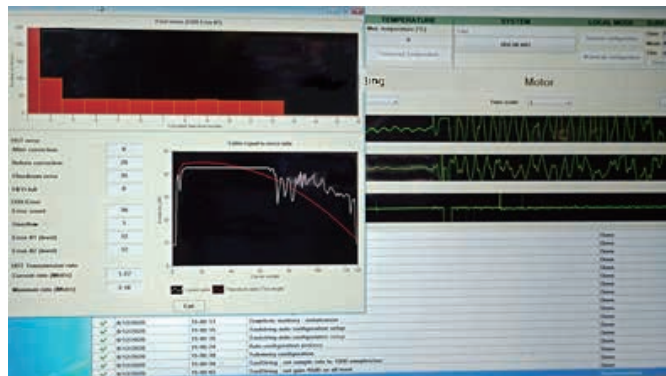
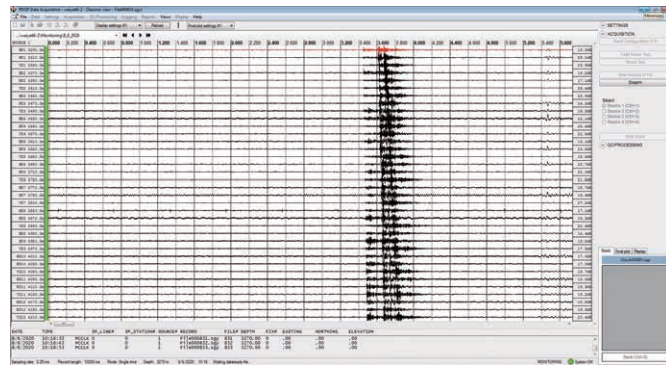
Applications

- Vertical Seismic Profile data acquisition and quality control
- Real time display of well log data
- Microseismic data acquisition



Introduction

PI Vertical Seismic Profile System (PIVSP) include: PIVSP Tool Control and PIVSP Data Acquisition. It is designed for the VSP series: SlimVSP, MagnetVSP, HTPVSP, TRVSP, MultiVSP, GeoVSP, PiezoVSP. PIVSP Data Acquisition is a software package for Vertical Seismic Profile data acquisition and quality control. Three source types are available: vibrator, impulsive and microseismic signal. PIVSP Data Acquisition can configure downhole tool according to tools status and provide comprehensive data quality control during signal acquisition. PIVSP Tool Control is the tools driver module included in PIVSP Data Acquisition software package. It can real time display of well log data (tension, gamma ray, CCL).



- SlimVSP: Suitable for hostile environments, slim size wellbore
- MagnetVSP: Lightweight, no motor, microseismic monitoring in horizontal well
- HTPVSP: The high temperature, high pressure tools



Applications

- Power supply to Downhole Tools
- Control the action of Downhole Tools
- Record logging data of Downhole Tools
- Self-test of Surface System and Downhole Tools for quality control



Introduction

Surface System is made of SIP (Seismic Interface Panel), SCP (Seismic Control Panel) and SPS (Seismic Power Supply panel). It also includes a PC with PIVSP Data Acquisition and PIVSP Tool Control softwares. The SIP interfaces all the input and/or output cable for auxiliary measurements. SPS supplies constant current power. Downhole tools are powered through the SCP panel by SPS panel. SCP panel is used for downhole control and data acquisition.

PIVSP can connect to GPS modules to record data in Greenwich Mean Time, enabling joint operations of multiple wells. Also, PIVSP is a fully automatic power supply system that allows for easy remote control.



Specifications

ENVIRONMENTAL SPECIFICATIONS:

Temperature Rating -23°F / 122°F (-5°C to 50°C)

POWER SUPPLY INPUT RATINGS:

Main Supply Voltage (Automatic Selection) 85-264 Vac

Main Supply Frequency 47-63 Hz

Maximum Power Input 2000 W

POWER SUPPLY OUTPUT RATINGS:

SPS Maximum Output Voltage 396 Vdc

SPS Maximum Output Current 2.8 A

The Auxiliary Channel 12 standard, expandable to 24

Pre-amplifier Gain 0 dB, 12 dB

PHYSICAL DIMENSIONS AND WEIGHTS:

Height 22.6 in. (57.48 cm)

Width 27.8 in. (70.49 cm)

Depth 29 in. (73.66 cm)

Weight 57.3 lbs. (26 kg) without transport box

103.6 lbs. (47kg) with transport box

Features

- Ultra slim body allows a wide range of wells.
- Maximum up to 100-levels in one run
- Unique bypass function can exclude a malfunction level and allows operation continued.



Introduction

With 12 levels SlimVSP at 0.25 ms sample rate inside adjacent hole, SlimVSP describes the geometry and spatial distribution of fracture growth during fracturing. SlimVSP is the perfect choice for digital multi-level array seismic surveys in the mining borehole. With 100-level digital 3-components, SlimVSP benefits from the most advanced developments in terms of real time telemetry and mechanical reliability, that makes system optimal solution to face to today's challenges: cost, effective, high volumes and high quality data.



Specifications

Maximum Temperature	350°F (175°C) 1 hour
Maximum Pressure	20000 psi (140 MPa)
Outside Diameter	1.77 in. (45 mm) VSP-S-AT 2.5 in. (63.5 mm) VSP-S-HT
Minimum Hole Diameter	3.0 in. (76.2 mm)
Maximum Hole Diameter	8.5 in. (216 mm) Standard Arms 14 in. (355 mm) Extended Arms
Length	59.06 in. (1.5 m)
Weight	26.46 lbs. (12 kg)
Anchoring Ratio	4:1
Geophone Sensor	SGHT-15
Number of Detector Ser Axis	1
Telemetry Rate	2,5 Mbits/s on 23,000 ft. (7,000 m) cable Up to 4 Mbits/s on shorter cable
Σ/Δ ADC Resolution	24 bits
Sample Rate	0.25 ms, 0.5 ms, 1 ms, 2 ms and 4 ms
Bandwidth	1666 Hz Max @ 0.25 ms
Maximum Levels	100
Gain	20 dB, 40 dB
Instantaneous Dynamic Range	122 dB
Wireline Requirement	7-Conductor Cable
Hole Type	Open hole/Cased hole
Auxiliary Tools	
Tension	Optional
Gamma Ray	Optional
CCL	Optional

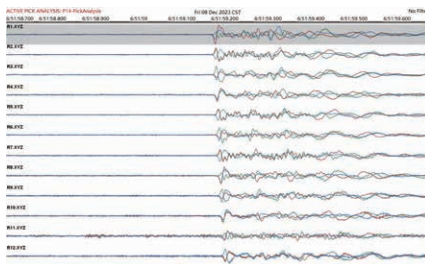
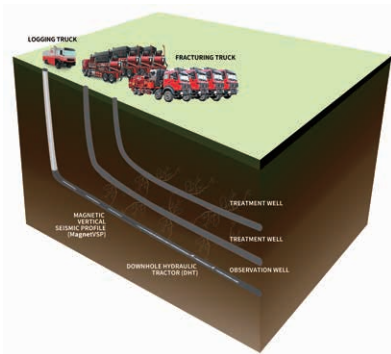


Magnetic Vertical Seismic Profile Tool (MagnetVSP)

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Features

- Ultra slim body allows a wide range of wells.
- MagnetVSP is closer to the horizontal target layer inside fracturing well, so that the event signal is more clear and easier to identify.
- Detonating cord positioning is not required, perforation signal meets positioning requirements.
- Combined with Downhole Hydraulic Tractor (DHT) the microseismic monitor of well group can be achieved.



Introduction

MagnetVSP is a downhole geophone which contact casing wall in electromagnetic adsorption way. The design without backup arm, low weight greatly reduce load and make MagnetVSP can combine with The Downhole Hydraulic Tractor (DHT) better. Combining with Downhole Hydraulic Tractor (DHT) can provide services in high deviated and horizontal wells with more levels up to 30 levels allowed multi-stages fracture job in one-time deployment. It can achieve completing a monitoring job by positioning receivers orientation of geophones with perforation signal one time and avoid moving geophones and positioning again.

Specifications

Maximum Temperature	350°F (175°C) 1 hour
Maximum Pressure	20000 psi (140 MPa)
Outside Diameter	2.1 in. (54 mm) VSP-E-AT 2.5 in. (63.5 mm) VSP-E-HT
Length	31.5 in. (0.8 m)
Weight	13.23 lbs. (6 kg)
Anchoring Mode	Magnetic adsorption
Anchoring Ratio	2.3:1 (Adjustable)
Geophone Sensor	SGHT-15
Number of Detectors per Axis	1
Telemetry Rate	2,5 Mbits/s on 23,000 ft. (7,000 m) cable Up to 4 Mbits/s on shorter cable
Σ/Δ ADC Resolution	24 bits
Sample Rate	0.25 ms, 0.5 ms, 1 ms, 2 ms and 4 ms
Bandwidth	1666 Hz Max @ 0.25 ms
Maximum Levels	100 without tractor 30 with tractor
Gain	20 dB, 40 dB
Instantaneous Dynamic Range	122 dB
Wireline Requirement	7-Conductor Cable
Hole Type	Cased hole
Compatible with Tractor	Yes
Auxiliary Tools	
Tension	Optional
Gamma Ray	Optional
CCL	Optional





High Temperature/High Pressure Vertical Seismic Profile Tool (HTPVSP)

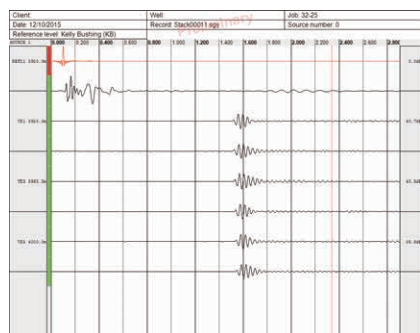
Geo-Vista

Benefits

- Both for Open and Cased Hole.
- Fast deployment to save time.
- Peak operating temperature of 200 degrees allows operating in the HP/HT wells.
- No active cooling structure, thus reducing power consumption and improving overall system reliability.

Features

- Any VSP from Zero Offset to large 3D.
- Fast telemetry rates allow for a maximum of 100 levels in one run.
- Single run for HP/HT wells - no need to make 2 runs using analog tools.
- Unique bypass function can exclude a malfunction level and allows operation continued.
- A separate DC power supplies power to the motor, controlling the time to fully open within 30 seconds



Introduction

HTPVSP is a digital three-component downhole geophone which allows to work in the environment with high temperature and high pressure. Up to 100 levels can be run which guarantees large VSP acquisition operations such as Walk Around and 3D VSP. 200°C/140 MPa meets the VSP operation requirements for ultradeep well with high temperature and high pressure. Fail safe anchoring arm design allows safe operation and retrieval in both cased hole and open hole.

Specifications

Maximum Temperature	400°F (200°C) 6-8 hours
Maximum Pressure	20,000 psi (140 MPa)
Outside Diameter	3 1/8 in. (79 mm)
Maximum Hole Diameter	11 1/8 in. (283 mm) Standard Arms 16 in. (408 mm) Extended Arms
Length	78.74 in. (2 m)
Weight	66.14 lbs. (30 kg)
Anchoring Ratio	4:1
Geophone Sensor	SGHT-15
Number of Sensors Per Axis	1
Telemetry Rate	2.5 Mbits/s on 23000 ft. (7000 m) cable Up to 4 Mbits/s on shorter cable
Σ/Δ ADC Resolution	24 bits
Sample Rate	0.25 ms, 0.5 ms, 1 ms, 2 ms and 4 ms
Bandwidth	1600~1700 Hz @ 0.25 ms
Maximum Levels	100
Gain	20 dB, 40 dB
Instantaneous Dynamic Range	122 dB
Wireline Requirements	7-Conductor Cable
Hole Type	Open hole/Cased hole
Auxiliary Tools	
Tension	Optional
Gamma Ray	Optional
CCL	Optional





Thermostatic Regulation Vertical Seismic Profile Tool (TRVSP)

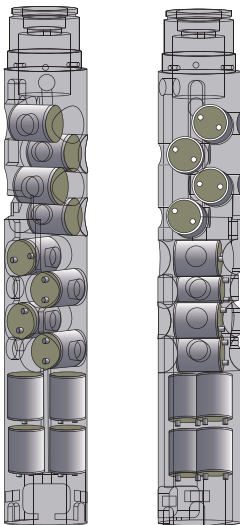
Geo-Vista

Benefits

- Both for Open and Cased Hole.
- Capable of micro-seismic monitoring above 160°C
- Tractor Compatible for deviated & horizontal wells.
- 4 geophones per axis to increase geophone sensitivity for micro-seismic monitoring applications.

Features

- The spring pushing method allows for quick re-configuration without pulling the tool out of hole.
- Four geophones per axis improve sensitivity and data quality, making it more suitable for micro-seismic monitoring.
- Fast telemetry rates for increased number of levels with no compromise for sampling rate.
- Unique bypass function can exclude a malfunction level and allows operation continued
- A separate DC power supplies power to the motor, controlling the time to fully open within 30 seconds.



4 Sensors Per Axis

Introduction

Capable of continuous acquisition of up to 320°F (160°C) and up to 20000 psi (140 MPa), TRVSP is very suitable for micro-seismic monitoring in high temperature wells. The ultra-high telemetry rate of 4Mbps/s ensures the operation of 12 levels at a sampling rate of 0.25ms. Fail safe anchoring arm design allows safe operation and retrieval in both cased hole and open hole. There is a through line reserved inside the instrument, which facilitates the connection of the tractor for horizontal wells.

Specifications

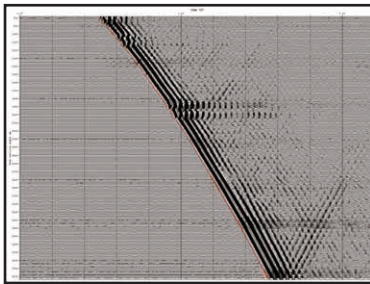
Maximum Temperature	320°F (160°C) For microseismic monitoring 350°F (175°C) For VSP *Electronic unit without thermostatic regulation
Maximum Pressure	20,000 psi (140 MPa)
Outside Diameter	3 1/8 in. (79 mm)
Maximum Hole Diameter	11 1/8 in. (283 mm) Standard Arms 16 in. (408 mm) Extended Arms
Weight	88.18 lbs. (40 kg) 44 lbs. (20 kg) *Electronic unit without thermostatic regulation
Anchoring Ratio	5:1 For microseismic monitoring 10:1 For VSP *Electronic unit without thermostatic regulation
Geophone Sensor	SGHT-15
Number of Sensors Per Axis	1,2,3,4 (Install as needed)
Telemetry Rate	2.5 Mbits/s on 23000 ft. (7000 m) cable Up to 4 Mbits/s on shorter cable
Σ/Δ ADC Resolution	24 bits
Sample Rate	0.25 ms, 0.5 ms, 1 ms, 2 ms and 4 ms
Bandwidth	1666 Hz Max @ 0.25 ms
Maximum Levels	100
Gain	20 dB, 40 dB
Instantaneous Dynamic Range	122 dB
Wireline Requirements	7-Conductor Cable
Hole Type	Open hole/Cased hole
Auxiliary Tools	
Tension	Optional
Gamma Ray	Optional
CCL	Optional





Applications

- Ultra High Productivity - Up to 100 levels, run at 2 ms sampling rate, real-time with short cycle times required by offshore surveys.
- Unequalled high channel count compared with standard conveyance.
- Use of the proprietary deployment system allows rapid system rig up and full system testing during deployment.
- Unique bypass function can exclude a malfunction level and allows operation continued.
- Fail safe anchoring arm design allows safe operation and retrieval in both cased hole and open hole.
- MultiVSP system uses standard GeoVSP auxiliary tools such as Gamma Ray, CCL and Tension/Compression.



Introduction

MultiVSP is the most cost effective digital multi-level downhole seismic array for large size downhole seismic surveys available on the market. Large size downhole survey: Improved reservoir delineation, faults & pinch-out detection, possible simultaneous 3D VSP and 3D surface seismic acquisition, applications to geological contexts such as overhangs, salt bodies, gas clouds. 4D survey: Improved reservoir imaging resolution (statically and dynamically). Improved Signal to Noise ratio and optimized repeatability to quantify time-lapse changes in the reservoir. Monitoring of fluid interfaces variation. Applications to water-flooding, gas injection, CO₂ sequestration.

Specifications

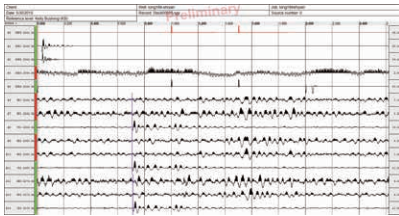
Maximum Temperature	260°F (125°C) Long Time 300°F (150°C) 4 hours 320°F (160°C) 1 hour
Maximum Pressure	15000 psi (103 MPa)
Outside Diameter	3.5 in. (89 mm)
Maximum Hole Diameter	9.17 in. (233 mm) Standard Arms 14 in. (355 mm) Extended Arms
Length	17.3 in. (440 mm)
Weight	18.7 lbs. (8.5 kg)
Anchoring Ratio	4:1
Geophone Sensor	SGO-15HT
Number of Sensors per Axis	1
Telemetry Rate	2.5 Mbits/s on 23,000 ft. (7000 m) cable Up to 4 Mbits/s on shorter cable
Σ/Δ ADC Resolution	24 bits
Sample rate	0.25 ms, 0.5 ms, 1 ms, 2 ms and 4 ms
Bandwidth	1666 Hz Max @ 0.25 ms
Maximum Levels	100
Gain	20 dB, 40 dB
Instantaneous Dynamic Range	122 dB
Wireline Requirements	7-Conductor Cable
Hole Type	Open Hole/Cased Hole
Auxiliary Tools	
Tension	Optional
Gamma Ray	Optional
CCL	Optional





Applications

- GeoVSP system can be run in any configuration
- Single level for check shot operations
- Multiple levels used inter tool cables of various lengths
- Using conventional wireline in the wells up to 60 degrees deviation
- Arms automatic closing after power off reduce the risk of tools stuck



Introduction

Geophysics Vertical Seismic Profile Tool (GeoVSP) is a digital three-component downhole geophone which allows to work in the environment with high temperature and high pressure. Up to 32 levels can be run which guarantees large VSP acquisition operations such as Walk Around and 3D VSP. The design that arms automatic closing after power off allows rapid and safe operations in both open and cased hole environments in borehole from 4 inches to 16 inches.

Specifications

Maximum Temperature	350°F (175°C)
Maximum Pressure	20,000 psi (140 MPa)
Outside Diameter	3 1/8 in. (79 mm)
Hole size	4 in. (101 mm) ~ 16 in. (408 mm)
Length	47.2 in. (1.2 m)
Weight	46.64 lbs. (21.2 kg)
Anchoring Ratio	10:1
Geophone Sensor	SMC1850-15Hz
Number of Detector per Axis	1
Maximum Level	32
Gain	20 dB, 40 dB
Instantaneous Dynamic Range	122 dB
Wireline Requirements	7-Conductor Cable
Hole Type	Open hole/Cased hole
Auxiliary Tools	
Tension	Optional
Gamma Ray	Optional
CCL	Optional



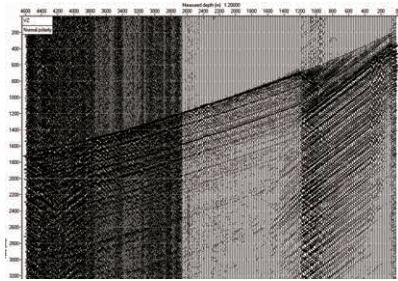


Piezoelectric Vertical Seismic Profile Tool (PiezoVSP)

Geo-Vista

Applications

- It is applied in the openhole, and suitable for high temperature and high pressure conditions. The slim diameter reduces stuck risks that provides operation security assurance.
- The acquired raw data has better quality.
- It is able to acquire first arrival and velocities data, sometimes, replaced Seismic While Drilling (SWD) operation.
- Even the cable adsorption stuck, without overshoot, the cut-and-thread fishing instrument is available for freeing stuck.
- Piezoelectric sensors, can hang 18 levels mandrels.



Introduction

The system has the characteristics of working stability, low cost and no need digital transmission. The analog signal is directly transmitted to the surface. It has a high operating safety without any backup structure. The geophones do not need to be attached to borehole wall, which reduces parking time for single shot and greatly reduce the risk of cable absorption to openhole wall. In addition ultra-slim tool body also decreases the risk of tools getting struck.

Specifications

Maximum Temperature	375°F (190°C) 3 hours
Maximum Pressure	20,000 psi (140 MPa)
Outside Diameter	1.89 in. (48 mm)
Weight	16 lbs. (7.3 kg)
Length	43.8 in. (1112.8 mm)
Hole Size	2.24 in. (57 mm)~16 in. (406.4 mm)
Power Supply	-32 Vdc/-48 Vdc/-64 Vdc /95 mA
Sensitivity	-205 dB (5.6 uv/ub)
Bandwidth Response frequency	0.2 Hz - 500 Hz
Maximum Level	18
Number of Detector Per Axis	7
Gain	80 dB
Instantaneous Dynamic Range	>120 dB
Dynamic Range	(80 dB) <93 dB
Total Harmonic Distortion	(80 dB) <0.001%
Full Scale Input Signal	(80 dB) 3.5 mVrms
Equivalent Noise Input	(80 dB) 25 μV
Crosstalk	>100 dB
Temperature Drift	2 μV/°C
Wireline Requirements	7-Conductor Cable
Hole Type	Open hole/Cased hole



Applications

- Cable Head allows system connection to a 7-conductor cable.

Introduction

There are two types of cable heads which used for the VSP series tools, one is CHV and the other is CHV-G. CHV is used for SlimVSP and MagnetVSP. CHV-G is used for HTPVSP, TRVSP, MultiVSP and GeoVSP.

Specifications

CHV	
Outside Diameter	1.69 in. (43 mm)
Cable Type	11.8 mm, 7-conductor armored cable
Weak Point	6,000 lbs. / 8,000 lbs.

*NOTE: When CHV is used for SlimVSP and MagnetVSP, its internal wiring relationships are inconsistent.



CHV-G	
Outside Diameter	3.11 in. (79 mm)
Cable Type	11.8 mm, 7-conductor armored cable
Weak Point	6,000 lbs. / 8,000 lbs.



Applications

- Inter connection between downhole geophones.



VSP-M-IC / VSP-G-IC



VSP-S-IC



VSP-E-IC

Introduction

Inter Cable is used for inter connection between downhole geophones. Coaxial cable increases the overall reliability and makes more geophones connection. The length of Inter Cable is usually designed 10 m, 15 m, 20 m.

VSP-S-IC / VSP-M-IC / VSP-G-IC / VSP-ES-IC is with the special customized coaxial cable of single conductor. VSP-E-IC is with the customized cable of 7 conductors which No.7 conductor is coaxial. It is special for MagnetVSP and has internal through line for connecting Downhole Hydraulic Tractor (DHT). VSP-H-IC is a 3- conductor cable, one of which is a coaxial cable used for communication, and the other two are used for supplying power to the motor. VSP-A-IC is with conventional logging cable of 7 conductors.

Specifications

VSP-S-IC / VSP-M-IC / VSP-G-IC / VSP-ES-IC

Make-up Length	10,15, 20, 25 and 30 m as standard (other lengths on request)
Cable Type	11.8 mm, mono-conductor armored cable
Cable Break Strength	85 kN / 19,000 lbs.
Maximum Temperature	475°F (246°C)

**NOTE: VSP-S-IC / VSP-M-IC / VSP-G-IC / VSP-ES-IC use same cable with different type connectors.*

VSP-E-IC

Make-up Length	10,15,20,25 and 30 m as standard (other lengths on request)
Cable Type	11.8 mm, 7-conductor armored cable, No.7 is coaxial
Cable Break Strength	85 kN / 19,000 lbs.
Maximum Temperature	400°F (200°C)

NOTE: VSP-E-IC has the same appearance with VSP-S-IC, just the amount of pins in the connectors is different.

VSP-H-IC

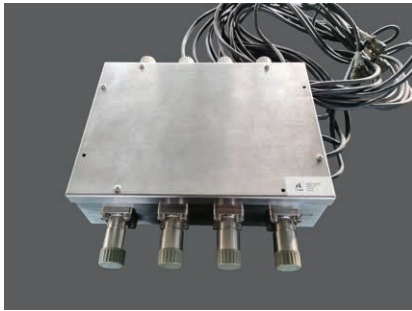
Make-up Length	10,15, 20, 25 and 30 m as standard (other lengths on request)
Cable Type	11.8 mm, 3-conductor armored cable, No.3 is coaxial
Cable Break Strength	85 kN / 19,000 lbs.
Maximum Temperature	500°F (260°C)

VSP-A-IC

Make-up Length	10,15, 20, 25 and 30 m as standard (other lengths on request)
Cable Type	11.8 mm, 7-conductor armored cable
Cable Break Strength	85 kN / 19,000 lbs.
Maximum Temperature	450°F (232°C)

Applications

- Air gun source supply in Vertical Seismic Profile data acquisition offshore or onshore



Transform Box



Air Gun Control Box



Air Gun

Introduction

Airgun source requires air compression system which includes air compressor, compressed air storage cylinders, air controller system. All equipment has been intergrated in a field container.

Air compressor can provides up to 25.0 MPa pressure with four stages compressing system and has auto-stop function. Safety release valves are used to control the compressed air in a limited range.

Specifications

Compressor Model	VF-2.0/250 CG diesel stationary
Compression Stages	4 stages
Air Supply	2.0 m ³ /min
Compressed Medium	Air
Inspiratory Pressure	Atmospheric
Rated Output Pressure	25 MPa
Opening Pressure of Safety Valve	
stage 1	0.4 MPa
stage 2	1.85 MPa
stage 3	8.5 MPa
stage 4	25.5 MPa
Input Air Temperature	≤40°C
Output Air Temperature	≤60°C
Compressor Speed	1200 r/min
Diesel Engine Stroke	115 mm
Engine Power	50 kW
The Type of Air Cylinder	Cgs219-50-31.5
Number of Air Cylinder	6





Applications

- Surface excitation source for Vertical Seismic Profile.
- Downhole excitation source for positioning receiver orient in microseismic monitoring jobs.
- Suitable for old perforated wells.

Benefits

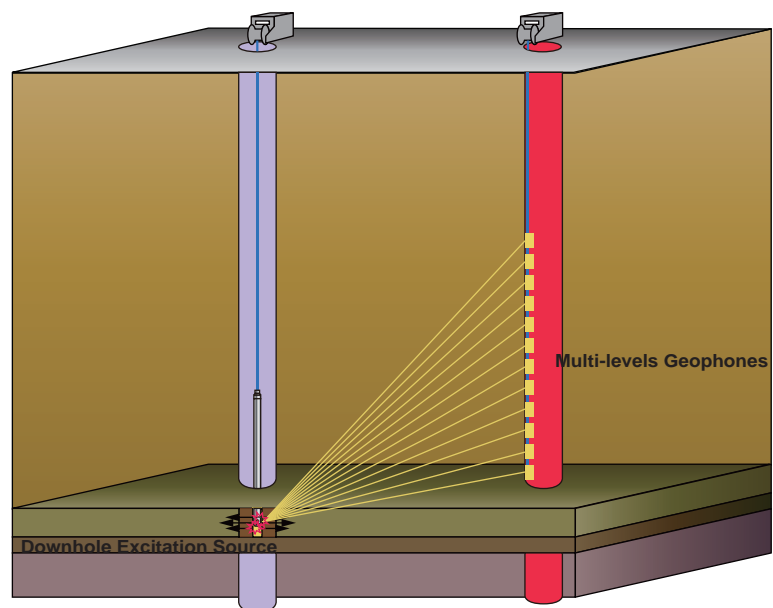
- The excitation energy is stronger than the perforation charge and first arrival is easier to identify.
- Compared with explosive source, it is more safe and more stable.
- Without special procedure for explosive materials and permissions.

Introduction

A new Non-Explosive Impulsive Source which is safer than explosive source is designed. It can be used as downhole excitation source for positioning receivers orientation for microseismic monitoring and also as surface excitation source for vertical seismic profile. It is used for the microseismic monitoring jobs that treatment well is an old well and perforated without requesting for additional explosive services or perforation signal from a treatment well is too weak to be identified.



Non-Explosive Impulsive Source



Downhole Excitation to Position Receivers Orientation

Applications

- Convey downhole tools along horizontal or highly deviated wells

Benefits

- Conveys tools in complex wellbores less expensively than coiled tubing or drillpipe
- Reduces personnel and equipment costs
- Enables fast rig-up, operation, rig-down

Features

- 12.0 feet length in the basic configuration.
- Conform to diameter changes from 3.75 to 15.0 inches depending on drive wheel used.
- Traction control allowing dynamic adjustment of the arm radial force which reduces the amount of slippage and unnecessary wear.
- The DHT release is compatible with any tool in the tool string, including addressable switches for guns.

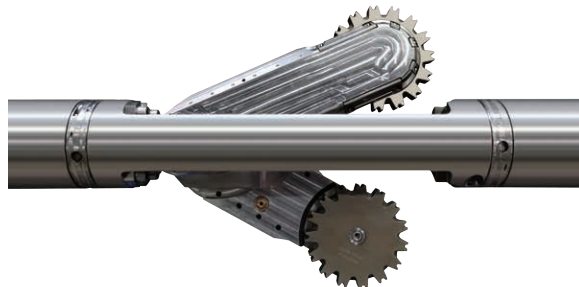


Introduction

The Downhole Hydraulic Tractor (DHT) is designed to transport logging tools and perforating gun in horizontal or highly deviated wells. It is suitable for open hole and cased hole.

Specifications

Maximum Temperature	350°F(175°C)
Maximum Pressure	20,000 psi (140 MPa)
Make-up Length	19 ft.-11.4 in. (6.08 m)
Weight	541 lbs. (245.4 kg)
Outside Diameter	3.375 in. (85.7 mm)
Minimum Hole Diameter	3.75 in. (95 mm)
Maximum Hole Diameter	15 in. (381 mm)
Hole Type	Cased hole or Open hole
Maximum Continues Load	2800 lbs. (1246 kg) (8 pairs - 16 wheels)
Nominal Creeping Speed	30 ft./min (9 m/min)
Maximum Creeping Speed	53.3 ft./min (16 m/min)
Surface Panels Power Supply	220 Vac/50-60 Hz
	380 Vac/50-60 Hz, 3-phase
Electronics Power Supply	120 Vdc
Motor Power Supply	3-phase, 500 Vac



Open Hole

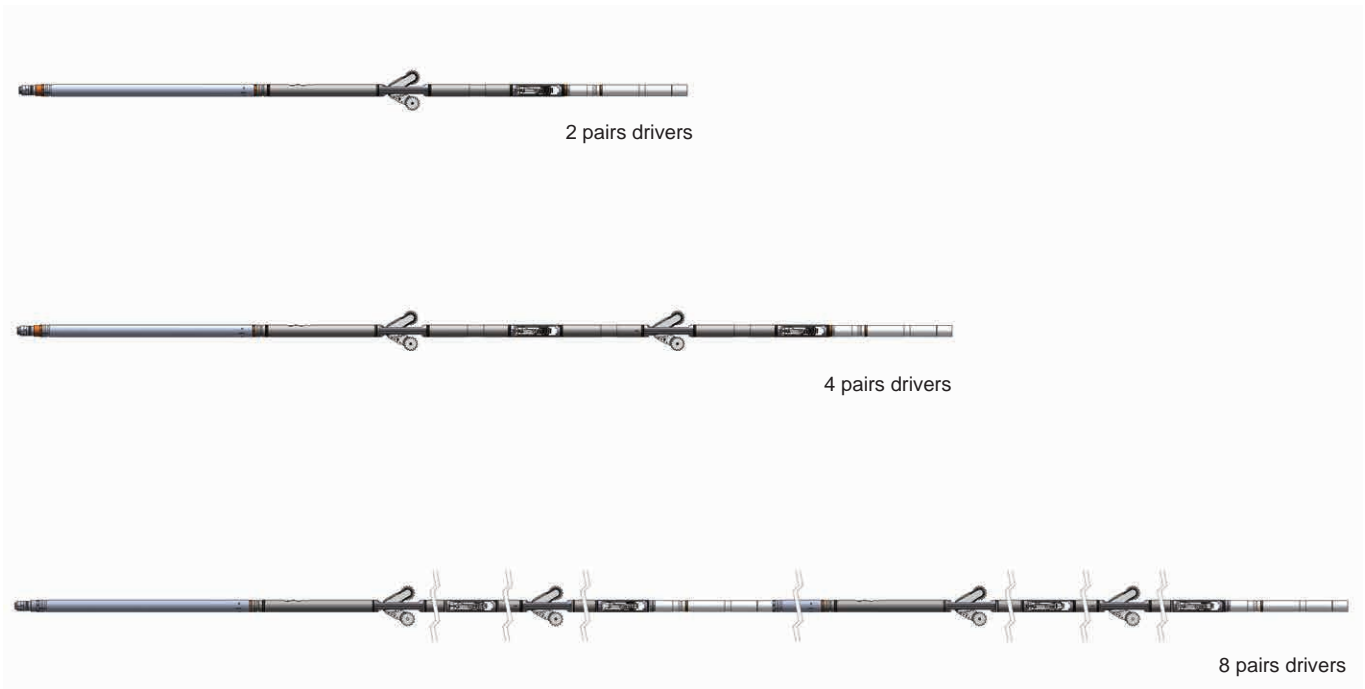


Cased Hole



Introduction

The DHT tractors allows for the addition of a second tractor in the tool string. Depending on the job at hand, the number of drive sondes can be increased to a maximum of eight. Various adapters and subs are also available to combine the tractor with a variety of logging tools or perforating guns.





Applications

- Long term monitoring of unmanned personnel on wellsite.

Introduction

- The GPS module keeps the data collected from multiple wells consistent in time, all in Greenwich Mean Time.
- Remote data transmission requires stable wireless or wired network connections, routers, and storage servers.
- The on-site data is transmitted to the storage server through the network, and the interpretation/operation engineer can access the data on the server through the network for processing and interpretation.
- If the on-site network can reach home level (fiber optic), it can complete real-time transmission of raw data.
- If the on-site network is poor and cannot meet the real-time transmission of raw data, it can be set to compress the raw data every hour and transmit it to the server.

- Wireless real-time transmission
- Optionally, the data can be compressed and transmitted every hour
- Up to 50 GB of data can be transferred daily



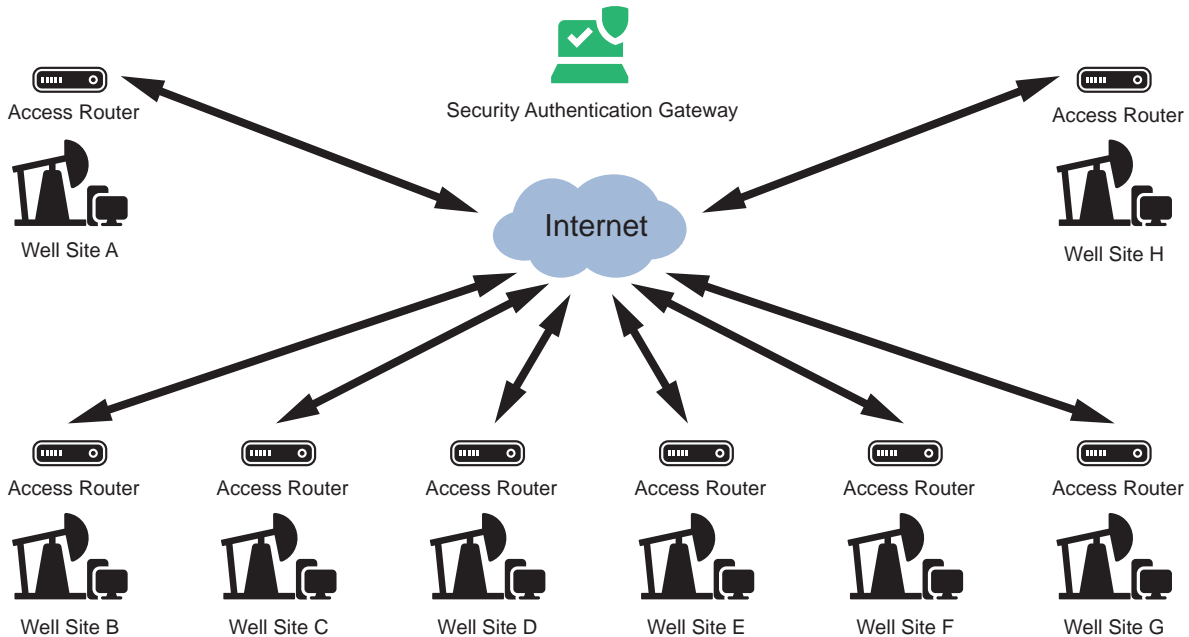
Data Interpretation



Storage Server

- 20 TB mass storage

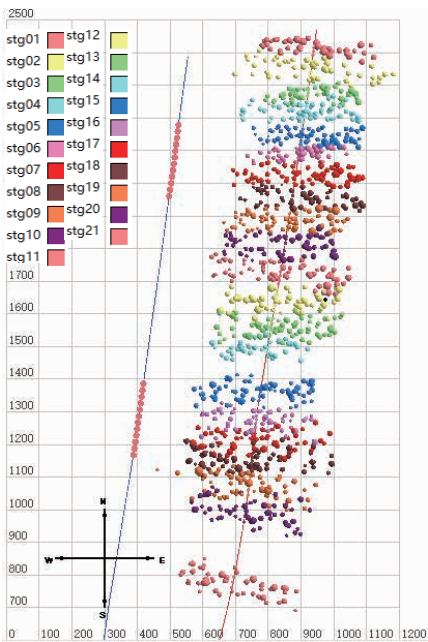
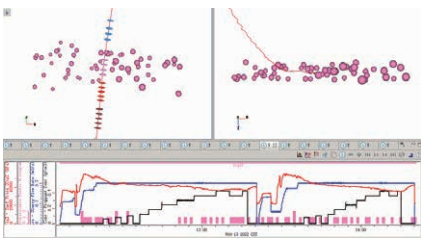
- Monitor the operating status of each well site computer





Applications

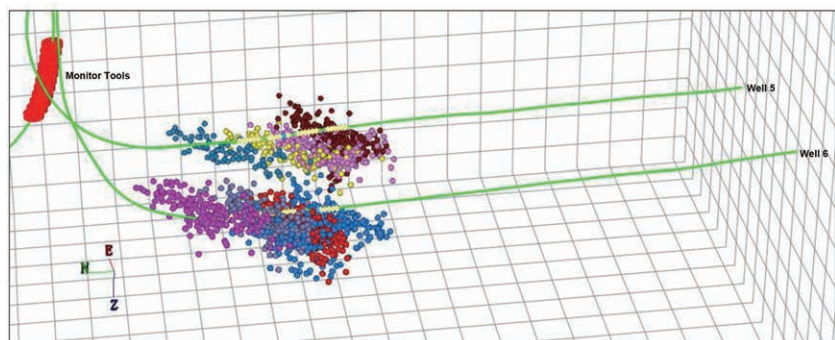
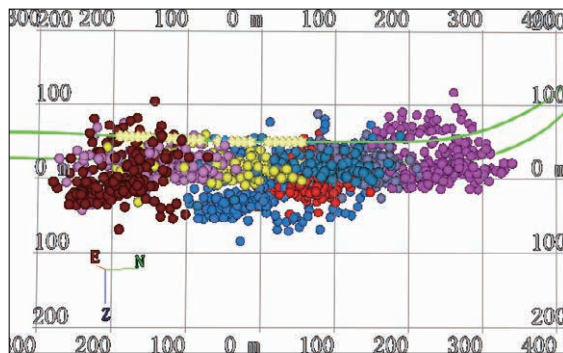
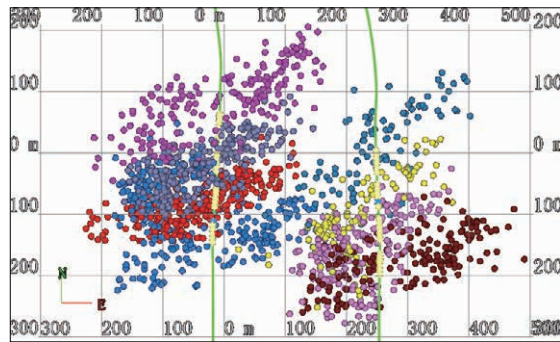
- Check the fracturing effect, analyze the fracture morphology in real-time, adjust the fracturing parameters, guide the fracturing construction in real-time, optimize the fracturing plan.
- Provide fracture network geometry to evaluate the fracturing effect and estimate the available oil and gas Stimulated Reservoir Volume (SRV).
- Provide fracture space shape and maximum main in-situ stress direction, etc. And provide important reference for the layout of oilfield development well patterns (horizontal well spacing, horizontal section length, fracturing classification and fracturing section length, etc.).



Introduction

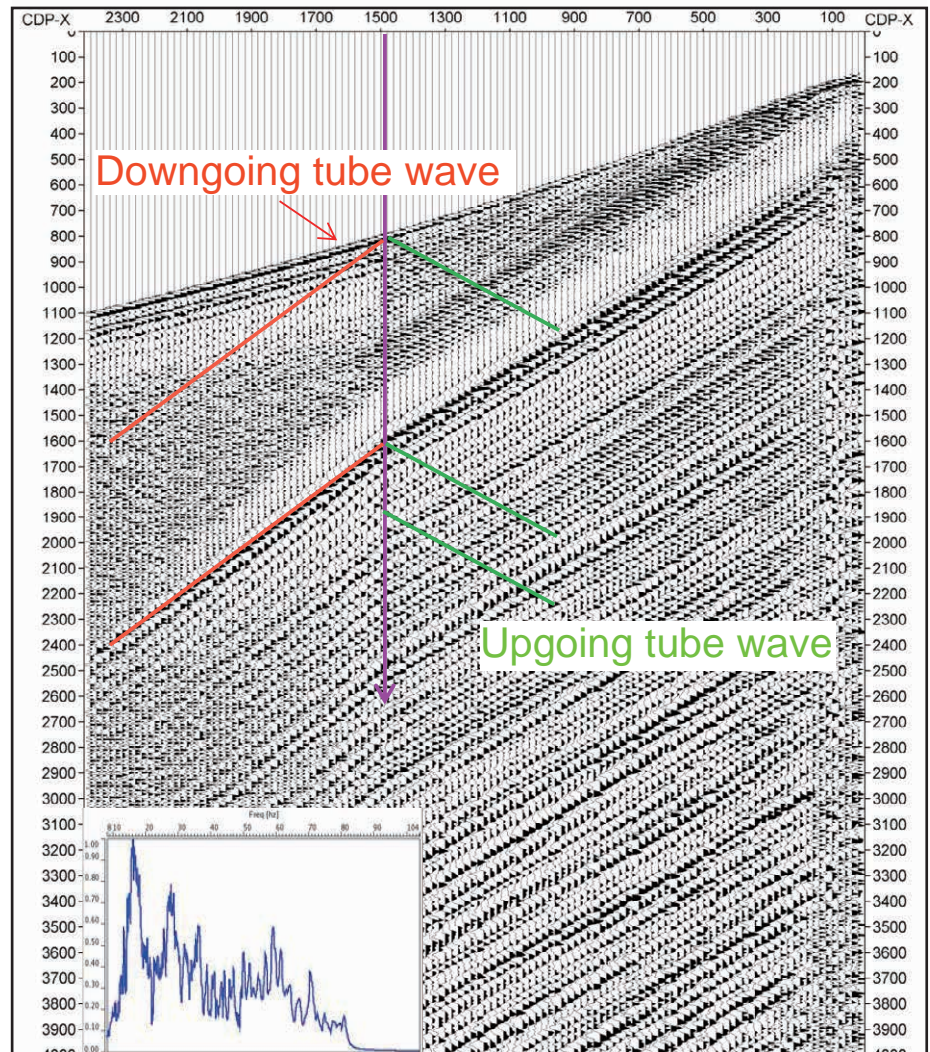
For unconventional oil and gas development and microseismic hydraulic fracturing monitoring technology development, our company develop microseismic monitoring module Microseismic Monitoring Data Processing & Interpretation Software (MMDPI) based on the logging interpretation platform PIView.

The main funtion includes reservoir reconstruction evaluation, fracture prediction, real-time decision, SRV model evaluation, important reference for the layout of oilfield development well patterns (horizontal well spacing, horizontal section length, fracturing classification and fracturing section length, etc) to meet users' demands for unconventional exploration and development technology.

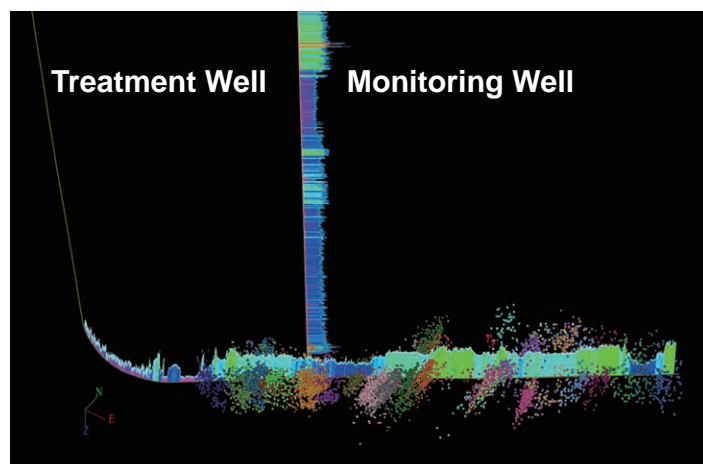




Clear downgoing P-wave
Clear reflection
Accurately pick first arrival
The wave velocity can be computed



Microseismic monitoring
at multi-stages in a
horizontal well of shale
gas for a long time under
high temperature and
high pressure.





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