

Low-Frequency Seismic Sounding (LFS)

CJSC Gradient offers a mobile and environmentally friendly hydrocarbon prospecting technology: Low-Frequency Seismic Sounding (LFS). Over 160 completed projects with total area more than 1300 sq. km confirms reliability of results. Efficiency of oil-saturation forecast is amounted to 85%.

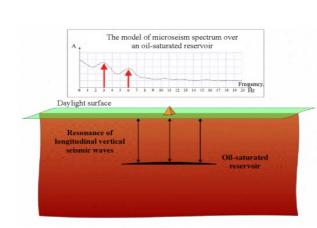
Application of LFS technology

- Geophysical prospecting for oil & gas
- Detailed works on the oil & gas fields
- Delineation of oil & gas fields
- Optimization of exploration and drilling
- Identification of anomalous objects in geological media

Theory of LFS method is based on mechanics of fluidsaturated, fractured and porous media. Oil and gas saturated reservoirs show themselves as anomalous objects in terms of low frequency seismic waves' reflection and attenuation.

Low-Frequency Seismic Sounding investigations include field surveys, data processing and interpretation.

Surveys are usually has 250x250m regular grid. Data acquisition is conducted using highly sensitive 3C low-frequency seismic receivers.



Advantages

- Mobility (conducting operations in regions difficult to access)
- Efficiency investigations on the area of 20 km² (300-400 measurement points) can be completed in two months: 1 month – data acquisition, 1 month processing, interpretation and delivery of a report
- Environmentally friendly and cost-effective technology without explosives, chemicals and drilling

Equipment

«Baikal-ACH88» recorder

Name	Unit	Value	
Number of input channels register		3	
ADC resolution		24	
Sampling frequency	Hz	100	
The band of the input signal	Hz	0-300	
Weight	kg	2.5	
Range of operating temperatures	°C	-40 +60	



Baikal-ACH88

Highly sensitive 3C broadband seismic receivers CME-4111-LT, LE-3Dlite

Name	Unit	CME-4111- LT	LE-3Dlite	
Conversion ratio	V/(m/s)	4 000	400	
Input signal		analog, differential		
Maximal recorded signal	V	±20	±5	
Band frequency	Hz	0.1-20	1-80	
Allowable slope	deg	±15		
Range of operating temperatures	°C	-40+55	-15 +65	



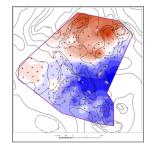
CME-4111-LT



LE-3DLite

Results





- Maps of oil/gas accumulation zones, identified by LFS method
- Oil and gas accumulation boundaries
- Recommendations for further optimization of exploration and drilling