

Presentation - 2024

- Borehole Imaging Televiewer
(page 2-4)
- Borehole Logging Probes
(page 5-18)
- Surface Data Logger with acquisition
Software (page 19)
- Winches and additional equipment
(page 20-21)
- Photos and references (page 22-23)



● Borehole Imaging Televiewers

● Optical Televiewer OPTV[©]

Key Specifications

	OPTV38	OPTV52
• Temperature (Max)	60°C/140°F	60°C/140°F
• Pressure (Max)	100 bar/1450 psi	100 bar/1450 psi
• Diameter	38 mm/1.5"	52 mm/1.2"
• Length	1620 mm/64"	1630 mm/64.2"
• Weight	6 kg/13 lbs	7 kg/15.4 lbs
• Recommended max. cable length	4-Go 3/16" cable, 2000 m (6500 ft) Monocable 1/10", 1000 m (3281 ft)	
• Housing	Titanium & non-magnetic brass	

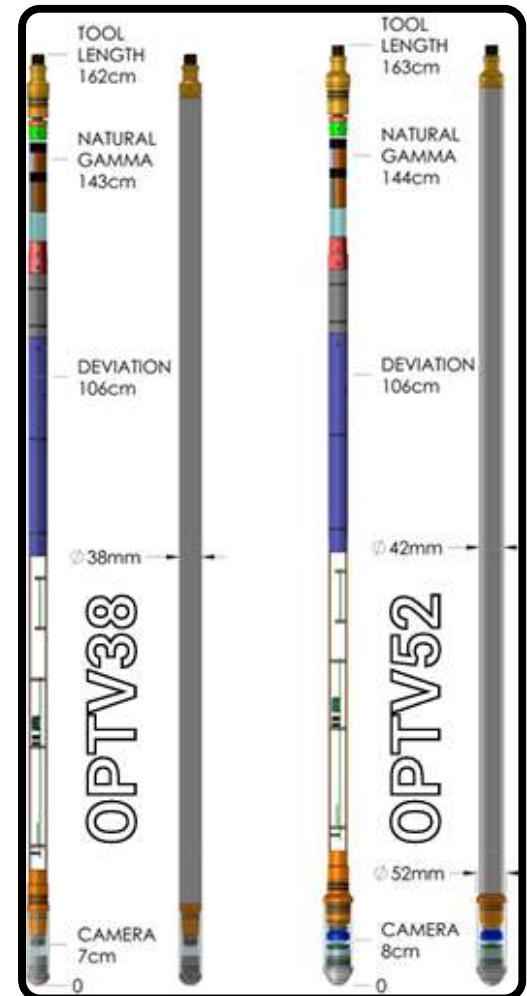
Data / sensor parameters

- **Camera** : 1280 x 1024 pixels CMOS
- **Image format** : 24-bit RGB
- **Horizontal resolution** : 360 to 1440 pixels
- **Vertical resolution** : defined by logging speed
(3.6 m/min for 1 mm resol.)
- **Orientation sensor** : triple magnetometers / accelerometers
- **Orientation precision** : $\pm 0,5^\circ$ inclination, $\pm 1^\circ$ azimuth

Accessories / options

- **Natural gamma detector** : $\varnothing 25 \times 50$ mm NaI(Tl) crystal
- **High Pressure kit OPTV52** : $\varnothing 62$ mm / 200 bar (± 2000 m)
- **Non magnetic centralisers**
- **Sinker weight**
- **Image reference calibrator**

Data acquisition
interface via
EminLogger



● Borehole Imaging Televiewers

● Acoustic Televiewer BHTV®

Key Specifications BHTV42

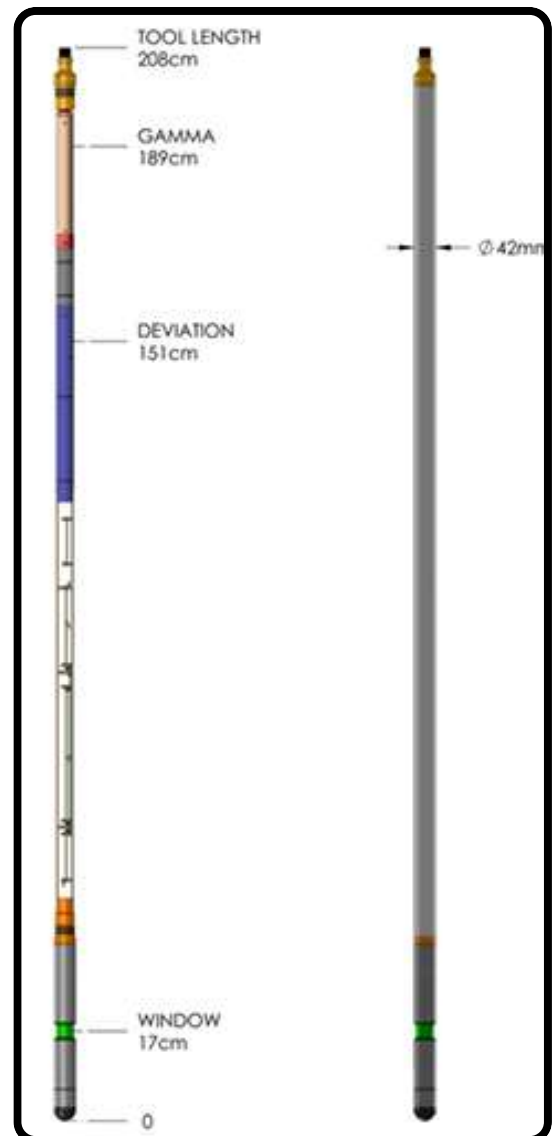
- **Diameter** : 42 mm / 1.65 "
- **Length** : 2100 mm / 82.7 "
- **Weight** : 8 kg / 17.6 lbs
- **Max. operating Temp** : 70°C (standard) 12°C (HT)
- **Max. operating Pressure** : 200 bar / 2900 psi / 250 bar (HP)
- **Recommended max.cable** 2000 m with 3/16" 4Go
cable length : 1000 m with 1/10" monocable
- **Housing type** : Titanium & non-magnetic brass

Data / sensor parameters

- **Max.communication speed** : 312.5 Kbit/sec.
- **Transducer** : 1" focussed piezo-composite and rotating mirror
- **Signal frequency** : 1.5 MHz
- **Acoustic beam angle** : 3°(3dB) conical
- **Amplification** : 0 to 60dB in 1dB steps/AGC
- **Horizontal resolution** : 90, 120, 180 or 360 pixels
- **Vertical resolution** : defined by logging speed (2.4 m/min if resol.is 2 mm)
- **Orientation sensor** : triple magnétometers / accelerometers
- **Orientation precision** : $\pm 0,5^\circ$ inclination, $\pm 1^\circ$ azimuth

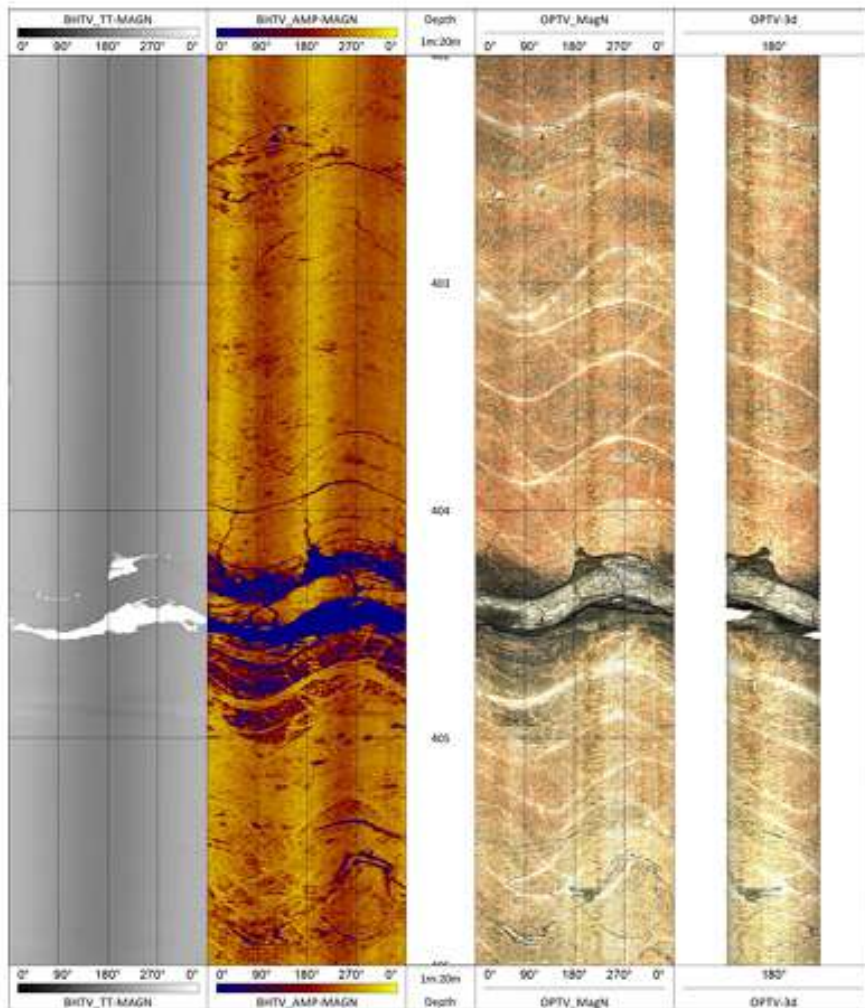
Accessories / options

- **Natural gamma detector** : $\varnothing 25 \times 50$ mm NaI(Tl) crystal
- **Non-magnetic centralisers**
- **Sinker weight**



Data acquisition
interface via
EmindLogger

● Case study – Borehole imaging for mining exploration



In the context of a base metals exploration project on a site located in Poland, BHTV42 and OPTV52 probes were deployed to obtain high-quality borehole wall images for mineralisation identification and structural geology data.

The pairing of these two methods was a major factor that helped towards the understanding and evaluation of this copper and molybdenum bearing stockwork-type mainly granite-hosted ore body.

To aid with core orientation and analysis, a synthetic core presentation was generated using the geometry of the borehole as obtained from the BHTV42 acoustic data and the optical images from the OPTV52.

The section of log opposite shows at least two different series of sub-parallel veins, as well as a fault or fracture that looks to have been re-mineralised by a later circulation of hydrothermal fluids.

Some chalcopyrite mineralisation is also visible.

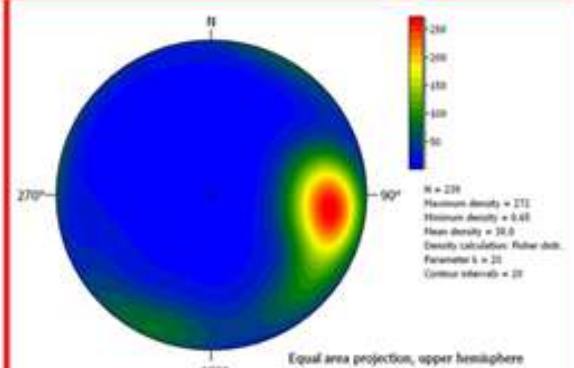


Logging operations underway in winter conditions

The exploration site was located on a tectonised belt separating two geological blocks of Precambrian age.

A number of reconnaissance boreholes were drilled down to depths exceeding 1000 m.

The structural analysis carried out on the basis of the borehole image data confirmed dominant vein and fracture alignments coherent with the local structural context.



Stereo projection of vein directions

● Borehole Logging Probes

● GR Probes

● Natural Gamma Radioactivity GR38 / GR25



Key Specifications

GR25

GR38

• Temperature (Max)	70°C	70°C
• Pressure (Max)	200 bar	200 bar
• Diameter	25 mm	38 mm
• Length	780 mm	1200 mm
• Weight	1.8 kg	3 kg

- Calibration option Factory calibr. in API units

Based on ø25 x 50 mm NaI(Tl) and ø12.7 x 50 mm NaI(Tl) scintillation crystal detectors coupled to a high performance photomultiplier tube, the GR38 and GR25 probes boast excellent sensitivity (± 1.2 cps / API unit) and provide a high quality final result.

● Spectral Gamma GRS42 / GR60



Key Specifications

GRS42

GRS60

• Temperature (Max)	70°C	70°C
• Pressure (Max)	200 bar	200 bar
• Diameter	42 mm	60 mm
• Length	1220 mm	1220 mm
• Weight	7 kg	12 kg

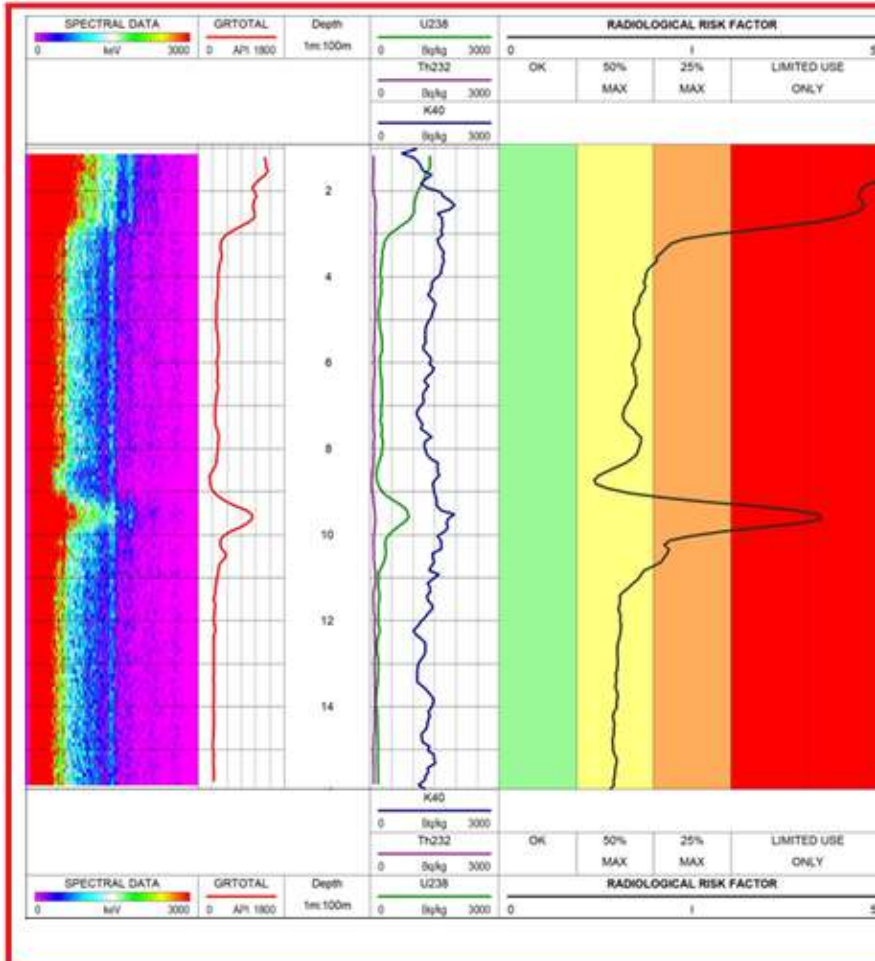
- Calibration option Carried out according to international standards

According to type the probe is capable of resolving 250 or 500 discrete gamma ray energy levels over the range 60 to 3060 keV; count rates from all of which are transmitted to the surface during logging

Data / sensor parameters

- Detector GRS42 : ø25x50mm NaI(Tl) crystal
- Detector GRS60 : ø50x150mm NaI(Tl) crystal
- Spectral Energie range : 60 to 3060 keV
- Spectral resolution : 250 ch * 12 keV (GRS42) 500 ch * 6 keV (GRS60)

● Case study – Spectral Gamma Logging



The French code of public health defines an annual dose equivalent limit of 1 mSv for members of the public exposed to gamma radiation in their homes or at their workplace.

From 2020 onwards, within the framework of this legislation, certain used in the construction industry will be subjected to a radiological assessment. The end result of this procedure is a factor "I" which represents the level of radiological risk linked to the material in question.

The factor "I" is determined from the individual uranium, thorium and potassium concentrations expressed in Bq/kg as follows:

$$I = \frac{C_{Ra226}}{300} + \frac{C_{Th232}}{200} + \frac{C_{K40}}{3000}$$

The individual concentrations required can be determined in-situ prior to extraction by means of spectral gamma-ray logs run in investigation boreholes traversing the concerned geological formations.

The results above reveal that while the entire interval would be subject to restriction, the uranium-rich surface layers and horizon between 9 m and 10 m depth where the "I" factor enters the red zone would be particularly problematic.



Detector section of the GRS60 spectral gamma probe.



Geophysical logging operations underway on the site under investigation.

● Borehole Logging Probes

● Nuclear probes

● Trisonde Density Probe TRS38G



Key Specifications

TRS38G

- Temperature (Max) 70°C
- Pressure (Max) 200 bar
- Diameter 38 mm
- Length 2330 mm
- Weight 12 kg

The TRS38G probe provides long-spaced (LSD) and high resolution (HRD) global density measurements, based on the Compton scattering principle, as well as a natural gamma log

- Accessories Source holder and transport container

Data / sensor parameters

- Source detectors spacing : Data / sensor parameters
- Density/nat.gamma detectors : $\varnothing 25 \times 50$ mm NaI(Tl) crystal
- Source type : 24 cm (HRD), 48 cm (LSD) Cs-137 (Ga energy 660 keV)
- Recommended source activity : 3.7 GBq (100 mCi)

● Dual Thermal Neutron Probe DTN38



Key Specifications

DTN38

- Temperature (Max) 70°C
- Pressure (Max) 200 bar
- Diameter 38 mm
- Length 2330 mm
- Weight 12 kg

Since the probe reacts strongly to hydrogen content, the principal application of this method is for formation water content (porosity) measurement. As an option (highly recommended), the probe can be supplied with a natural gamma detector to permit the influence of clay content on the results to be evaluated. A Casing Collar locator option can also be added.

- Accessories CCL / Source container (transport) / Natural gamma detector

Data / sensor parameters

- Thermal neutron detectors : 25 x 200mm He³ tube (4 bar)
- Source – detector spacings : 24 cm (SSN), 48 cm (LSN)
- Source type : Am/Be (mean energy 4MeV)
- Recommended source activity : 37 GBq (1 Ci)

● Borehole Logging Probes

● Nuclear probes

● Uranium Exploration Probe UEP45



Key Specifications

UEP45

- Temperature (Max) 70°C
- Pressure (Max) 200 bar
- Diameter 42 mm
- Length 2260 mm
- Weight 11 kg

The UEP42 probe provides a set of data parameters responding perfectly to the needs of both uranium exploration and in-mine grade control. The probe is equipped with two complementary high and low sensitivity gamma radioactivity sensors to allow reliable results to be obtained over a wide range of uranium concentration values.

Data / sensor parameters

- Gamma detector #1 : $\mu\text{ø}25 \times 50\text{mm}$ NaI(Tl) crystal
- Gamma detector #2 : dual ZP1200 G-M tubes
- Inclination range/accuracy : 0 to 180° / $\pm 0.5^\circ$
- Azimut range/accuracy : 0 to 360° / $\pm 1^\circ$
- Resistivity injection signal : 200 Hz sine wave with ALC
- Resistivity measuring range : 0 to 25 k $\Omega \cdot \text{m}$ (16-bit)

● Photo-electric density probe PDGC50



Key Specifications

PDGC50

- Temperature (Max) 70°C
- Pressure (Max) 200 bar
- Diameter 50 mm
- Length 2500 mm
- Weight 20 kg

The PDGC50 probe provides a classic triple-spacing sidewall focussed formation density measurement, with the additional advantage of incorporating a photo-electric effect energy detection window on the medium-spacing detector

Data / sensor parameters

- Long-spacing density : 25 x 50 mm NaI(Tl) crystal
- Medium-spacing density + Pe : 10 x 50 mm NaI(Tl) crystal
- Bed resolution density : 10 x 25 mm NaI(Tl) crystal
- Caliper range : 50 to 450 mm
- Natural gamma detector : 25 x 50 mm NaI(Tl) crystal

● Borehole Logging Probes

● GR + Temp

● Natural Gamma / Temperature probe GRT38



Key Specifications

• Temperature (Max)	80°C
• Pressure (Max)	200 bar
• Diameter	38 mm
• Length	1180 mm
• Weight	3 kg

GRT38

The GRT38 probe provides a solution for cases where only a basic, total counts natural gamma log is required and also provides a borehole fluid temperature measurement useful for correcting certain other logs. A CCL option can be added

Data / sensor parameters

- Natural Gamma detector : Cristal $\varnothing 25 \times 50$ mm NaI(Tl)
- Temp. range / resolution : 0 to 65°C / 0.001°C

● Borehole Logging Probes

● Electric Probes

● Electric Logging ELG46



Key Specifications

ELG46

- Temperature (Max) 70°C
- Pressure (Max) 200 bar
- Diameter 46 mm
- Length 1990mm
- Weight 8 kg

As standard, the ELG46 probe provides long (64") and short (16") normal resistivity, single-point resistance (SPR) and self-potential (SP) data.

Widely employed in the domain of groundwater resources exploration and evaluation, the probe is suitable for use in formations having resistivity values of between 10 and 25 000 $\Omega \cdot m$

Data / sensor parameters

- Resistivity injection signal : 200 Hz sine wave with ALC
- Resistivity measuring range : 0 to 25 k $\Omega \cdot m$ (16-bit)
- Resistivity resolution : 0.4 $\Omega \cdot m$
- SP measuring range : ± 1500 mV
- SP resolution (accuracy) : ± 1 mV
- Option : Natural gamma detector $\varnothing 25 \times 50$ mm NaI(Tl) crystal

● Single induction (small diameter) EM25



Key Specifications

EM25

- Temperature (Max) 70°C
- Pressure (Max) 200 bar
- Diameter 25 mm
- Length 1950mm
- Weight 2.5 kg

The Slim Single Focused Induction EM25 sonde main features are : Formation conductivity measurement in dry or fluid-filled borehole or even in PVC casing /Phase detector discriminates between magnetic susceptibility and conductivity signals /Natural gamma measurement available for correlation

Data / sensor parameters

- Operating Frequency : 39.062 kHz
- Number of coils : 4
- Effective Tx-Rx Spacing : 50cm (20")
- Measuring Range : 0 to 3000mS/m
- Resolution : 0.2mS/m
- Drift over T°range : <5mS/m

Präsentation

Produktpräsentation und Fallstudie



● Borehole Logging Probes

● Electric Probes

● Dual Induction Probe DIL38



Key Specifications

DIL38

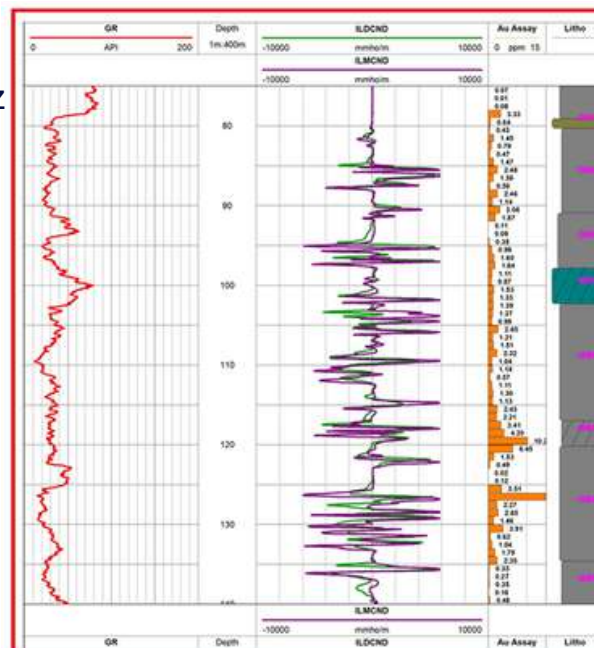
- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 38 mm
- **Length** 2150 mm
- **Weight** 6 kg

Data / sensor parameters

- **Effective spacing** : 510 mm (ILM) ; 810 mm (ILD)
- **Operating frequency** : 39.0625 KHz
- **Range** : 0.2 to 5.500 mS/m (about 0.22 Ohm.mFS)
- **Measurement resolution** : 0.25 mmho/m
- **Effective range (resistivity)** : 0.2 to 200 $\Omega \cdot m$

● Case study – Spectral Gamma Logging

The DIL38 induction conductivity probe generates an electromagnetic field in the vicinity of the borehole and measures the response of the formations to this applied field. The relatively low operating frequency and the design of the coil array combine to minimise borehole effects and maximise both depth of investigation and vertical resolution.



The example log shown on the left was recorded in an HQ-cored borehole drilled on a gold exploration prospect located in West Africa.

In massive, non-altered and nonmineralised bedrock the probe indicates values close to zero conductivity corresponding to the centre of the log track.

In contrast, the probe response becomes highly agitated while traversing a altered/mineralised zone between 80 and 140 m depth. In this geological context, sulphide mineralisation in the form of pyrite and pyrrhotite is often an indicator for the presence of gold. The assay results in terms of Au g/t over this interval tend to confirm this hypothesis.

The form of the ILM and ILDCND responses would seem to correspond to a series of "dipole" type features, such as can be obtained over conductive bodies in surface EM prospecting.



DIL38G probe (left) – the transmitter and receiver coil arrays are located in the non-conductive fibre glass section of the probe body.

Logging operations underway on site (right). Other logs run as standard in these boreholes included magnetic susceptibility, induced polarisation and acoustic imaging surveys.



● Borehole Logging Probes

● Electric Probes

● Focussed resistivity probe GUIP38



Key Specifications

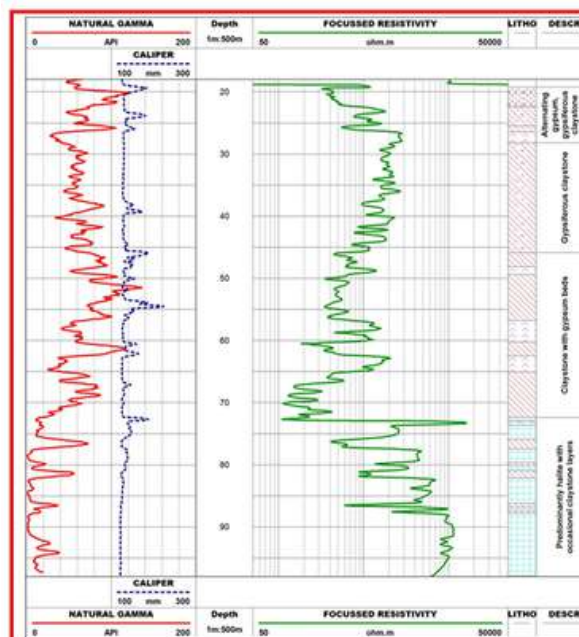
- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 38 mm
- **Length** 2380 mm
- **Weight** 7 kg

Data / sensor parameters

- **Resistivity meas. range:** : 0 to 8 kΩ·m (high resolution) / 0 to 32 kΩ·m (full range)
- **Resistivity precision:** : 0.125 Ω·m (high resolution) / 0.5 Ω·m (full range)
- **Option** : Natural gamma detector: Cristal ø25 x 50mm NaI(Tl)

● Case study – Focussed resistivity

Due to focussing of the injection current, this method allows a resolution of thinner layers compared to a log of the traditional “normal” type. The other advantage of this method lies in the fact that it is suitable for difficult hole conditions (salt mud). This type of log is most often used for formation evaluation (lithology / porosity) and groundwater quality studies.



The example log shown on the left was recorded in an PQ-cored borehole drilled as part of a geological and hydrogeological investigation in a faulted region in the Alsace region of France where problems of ground subsidence have been encountered. These problems are thought to be related to the interaction of groundwater with the many evaporitic horizons present in the near-surface geological section.

The very high resistivities recorded in the lower part of the borehole are caused by the presence of massive halite beds. The interbedded claystone layers, some only 10 to 20 cm in thickness, are clearly delimited.

The predominantly claystone layers above 73 m include a number of gypsum beds and themselves become richer in gypsum content moving upwards through the drilled interval.

A caliper log was also run in this borehole and has revealed several less well indurated layers that have been partially washed out during the drilling process.



Core box photograph showing a section of the massive halite beds present in the lower part of the drilled section (left).

LIM Logging vehicle on site during the logging operation (right).



Präsentation

Produktpräsentation und Fallstudie



● Borehole Logging Probes

● Electric Probes

● Induced polarisation probe IP38



Key Specifications

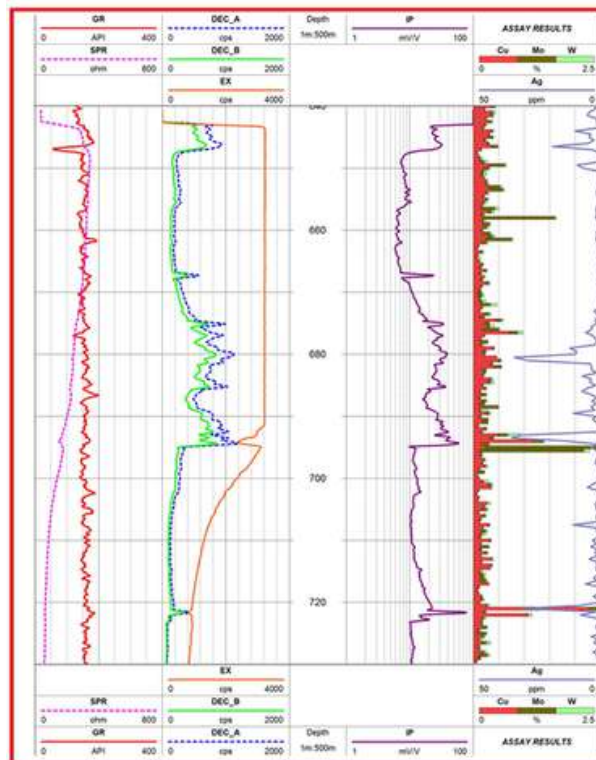
- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 38 mm
- **Length** 2790 mm
- **Weight** 7 kg

Data / sensor parameters

- **Measuring range** : SPR 010,000 ohm.m
- **Measuring range** : IP ratio A/B (mV/V)
- **Option** : Gamma ray sensor: ø25 x 50 mm NaI(Tl) crystal

● Case study – Induced polarisation

The formations surrounding the borehole are subjected to an alternative square-wave voltage applied via the upper and lower injection electrodes. Following each injection cycle, the resulting potential difference over a section of the formations is analysed as it decreases with time. The form of this decreases curve is related to the chargeability of the formations.



The example log shown on the left was recorded in an HQ-cored borehole drilled on an exploration prospect located in eastern Europe.

The deposit is of a "stockwork" type, consisting of a network of mineralised veins hosted within a granitic body. Different phases of hydrothermal mineralisation have resulted in localised, elevated concentrations of Cu (chalcopyrite), Mo (molybdenite) and W (scheelite) in particular.

A weathered and mineralised section between ± 668 and 695 m gives rise to a significant IP anomaly but is "invisible" on the natural gamma log (GR).

Below 690 m the probe's excitation voltage reduces as a result of encountering highly saline borehole fluid: this does not, however, prevent the detection of a thin mineralised zone at around 722 m.



Core photos showing typical chalcopyrite (left) and molybdenite (right) mineralisation as encountered in this borehole.

● Borehole Logging Probes

● Electric Probes

● Dual-range magnetic susceptibility MAG38 "MAGSUS"



Key Specifications

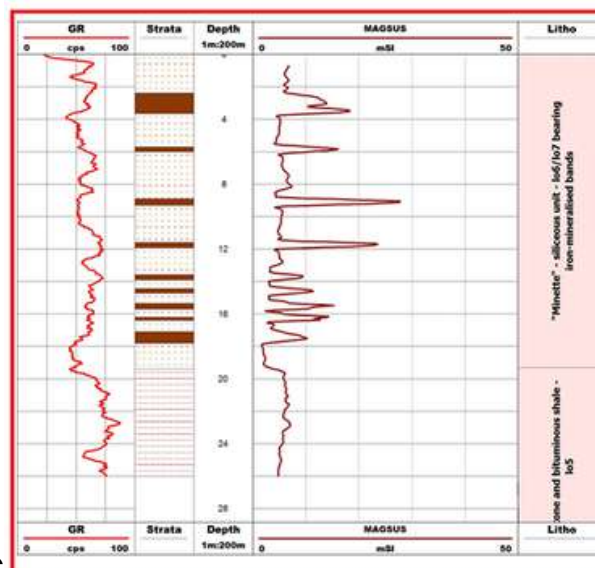
- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 38 mm
- **Length** 1960 mm
- **Weight** 7 kg

Data / sensor parameters

- **Operating Frequency** : 2 kHz
- **TX-RX spacing** : 50cm / 20"
- **Measuring range** : 10-4 to 0.5 SI units
- **✓ Resolution** : 6 µSI units
- **Option** : Natural Gamma detector: ø25 x 50 mm NaI(Tl) crystal

MAG38

The MAG38 probe incorporates a high performance, dual coil antenna system developed in-house. This low frequency electromagnetic device ensures a stable response over a wide range of temperature and pressure conditions. The received signal is digitised at two sensitivity levels to optimise use in both low and high susceptibility operating conditions.



The example log shown on the left was recorded in a borehole drilled through the iron-bearing strata of the "Minette" region of Luxembourg.

The iron mineralisation is sedimentary in origin and occurs in a series of oolitic beds.

Since, in this case, the iron mineralisation is present in the form of haematite, the extremely high values characteristic of rocks containing magnetite were not observed.

Nevertheless, each individual bed is well-defined and the amplitude of the response varies according to iron content.

The probe used also provided a natural gamma log.

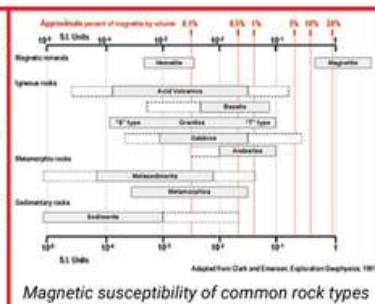
● Case study – Magnetic susceptibility



Outcrop of iron-bearing "Minette" formations (photo © OUGS)

The photo to the left shows an outcrop of iron-bearing "Minette" formations at a site in the south of Luxembourg.

The table to the right gives typical magnetic susceptibility values for a number of commonly-encountered rock types. The values are displayed in SI units on a logarithmic scale.



Magnetic susceptibility of common rock types

Präsentation

Produktpräsentation und Fallstudie



● Borehole Logging Probes

● Sonic Probe

● Fullwave Sonic : FWS60



Key Specifications

• Temperature (Max)	70°C
• Pressure (Max)	150 bar
• Diameter (transducers/tool body)	60 mm / 42 mm
• Weight	7 kg
• Length (depends on config)	2610 mm (3RX) 2960 mm (3RX + gamma) 3060 mm (4RX) 3360 mm (4RX + gamma)

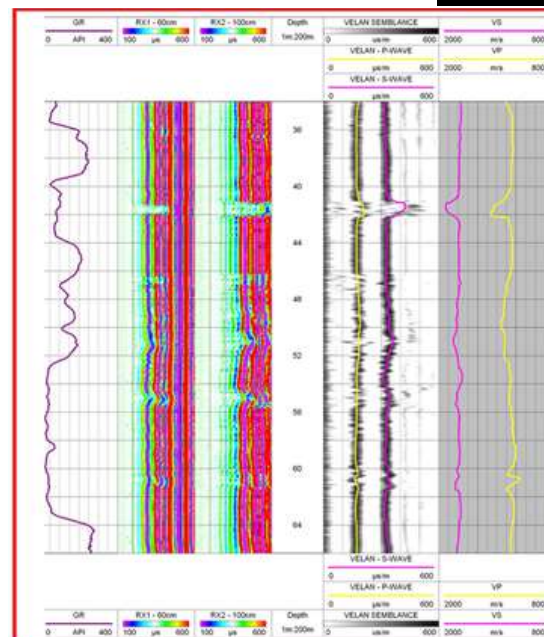
FWS60

The sonic waveform data provided by the FWS60 has many applications: these include the determination of formation mechanical properties, fracture analysis, permeability and porosity estimation and cement bond assessment.

Data / sensor parameters

- **Signal frequency** : 12 – 15 KHz
- **Acquisition** : 16 Bit / 96 dB dynamic
- **Sampling** : 256 – 512 – 1024 at 4μsec (250.000/sec)

- **Option** : Natural Gamma detector: ø25 x 50 mm NaI(Tl) crystal / Bowspring centralisers / Sinker weight



The example log shown on the left was recorded in an HQ-cored borehole drilled through a sequence of metamorphic formations as part of a geotechnical investigation in the Alpine region of France. The borehole was inclined at more than 45° to the vertical over the section shown.

The **FWS60G** probe used was equipped with two sonic wave-train receivers (located at 60 and 100 cm from the transmitter) and a natural gamma detector.

A velocity analysis process using the semblance method was applied to the raw data in order to obtain P- and S-wave acoustic velocities.

Between 40 and 56 m the borehole has traversed a fractured zone, as shown by localised signal energy losses and decreases in calculated acoustic velocity.

The variations in gamma ray response (at the far left on the image) clearly delimit the different lithological units encountered by the borehole over this interval.



The borehole encountered very hard and abrasive metamorphic rocks (meta-limestones, gneiss with multiple quartz veins and quartz-rich horizons), the photo opposite shows a typical core sample.

● Case study – Full Wave Sonic logging

● Borehole Logging Probes

● Hydraulic Probes

● Temperature / Conductivity / Flow : FTC60



Key Specifications

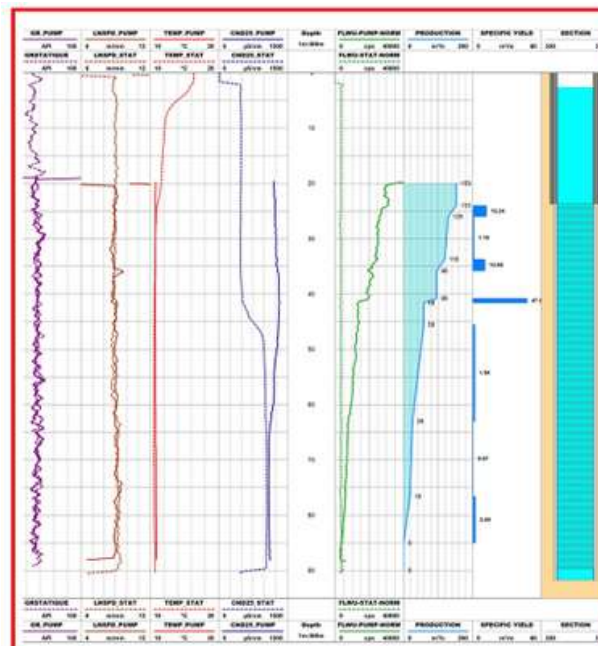
- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 60 mm
- **Length** 1220 mm
- **Weight** 5.5 kg

FTC60

The lightweight impeller and low friction bearing assembly permit this probe to react almost instantly to any vertical movement within the fluid column of a well or borehole. The direction of flow relative to the probe can be determined from the sense of rotation of the impeller.

Data / sensor parameters

- **Temperature range** : 0 to 65°C
- **Temperature resolution** : 0.001°C
- **Conductivity linear range** : 0 to 4500 $\mu\text{S/cm}$
- **Conductivity full range** : 0 to 12000 $\mu\text{S/cm}$
- **Conductivity resolution** : 1 $\mu\text{S/cm}$
- **Fluid flow range** : ± 1 to 30 m/min
- **Fluid flow resolution**: 0.1 m/min



An **FTC60G** probe was used to establish a production profile in a well drilled for de-watering purposes, in a "post-mining" context, on a site located in the east of France.

Logs were recorded with the well in both static and pumping conditions.

The results show that the well produces over the majority of the screened interval, however a particularly productive zone is present just below 40 m depth which accounts for around 30% of the total yield.

While the temperature profile remains essentially unchanged between the static and pumping logs, the conductivity curve shows that the water being produced from 65 m upwards exhibits significantly higher conductivity (1 250 $\mu\text{S/cm}$) than was observed in the fluid column with the well at rest (500 $\mu\text{S/cm}$).

Option : Natural gamma detector :
Cristal $\varnothing 25 \times 50$ mm NaI(Tl)

● Case study - Temperature / Conductivity / Flow



The photo opposite shows the lower part of the **FTC60** probe with the impeller and combined temperature and conductivity sensor mounted on the tool body just above.

The impeller cage measures 60 mm in diameter and the probe is generally run fitted with centralisers.

Reliable flowmeter readings can be obtained in low flow velocity conditions (from around 1 m/min).

As well as the fluid parameters, the probe also provides the logging speed and (optionally) a natural gamma measurement.

● Borehole Logging Probes

● Borehole geometry

● Borehole Deviation : BDV42



Key Specifications

BDV42

- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 42 mm
- **Length** 1760mm (probe only)
2240 mm (w.weights)
- **Weight** 7 kg

Data / sensor parameters

- **Measurement resolution** : Azimuth : $\pm 0.1^\circ$ & Inclination : $\pm 0.1^\circ$
- **Measurement accuracy** : Azimuth : $\pm 0.5^\circ$ & Inclination : $\pm 0.2^\circ$
- **Gamma-ray sensor** : $\varnothing 25 \times 50$ mm NaI(Tl) crystal

The probe is based on a high-precision combination magnetometer and accelerometer sensor providing a continuous measurement of borehole inclination and azimuth. Because of the resulting magnetic disturbance, reliable azimuth data can not be obtained in steel-cased wells or in iron-rich geological formations

● Three-arm caliper probe 3AC38



Key Specifications

3AC38

- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 38 mm
- **Length** 2360mm (short arms)
2470 mm (long arms)
- **Weight** 7 kg

Data / sensor parameters

- **Diameter range** : 40 to 700 mm
- **Diameter resolution** : 0.1 mm
- **Option** : Natural Gamma detector : $\varnothing 25 \times 50$ mm NaI(Tl) crystal

By means of three spring-loaded arms maintained in contact with the borehole wall, the 3AC38 probe provides a representative measurement of the borehole diameter. The standard probe nose section and arms provide a high resolution measurement over the diameter range from 40 to 300 mm. If the supplied arm extensions and nose section extension tube are installed, the upper diameter limit is increased to 700 mm.

● Borehole Logging Probes

● Borehole geometry

● Four-arm caliper probe 4AC60



Key Specifications

4AC60

- **Temperature (Max)** 70°C
- **Pressure (Max)** 200 bar
- **Diameter** 60 mm
- **Length** 3100 mm
- **Weight** 18 kg

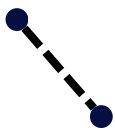
Data / sensor parameters

- **Diameter range:** 60 to 450 mm
- **Diameter resolution:** 0.1 mm
- **Orientation sensor:** triple magnetometers : accelerometers
- **Measurement range:** Full 360° inclin./ azimuth
- **Orientation precision :** +/- 0,1° inclination, +/-0,5° azimuth

The 4AC60 borehole geometry probe incorporates two pairs of caliper arms giving independent, perpendicular X-Y diameter measurements, while a magnetometer/accelerometer orientation system provides the borehole azimuth, inclination and X-Y arm directions.

● Borehole geometry

Gyroprobe GYR38



Key Specifications

4AC60

- **Temperature (Max)** 85°C
- **Pressure (Max)** 200 bar
- **Diameter** 38 mm
- **Length** 1690 mm
- **Weight** 6 kg

Data / sensor parameters

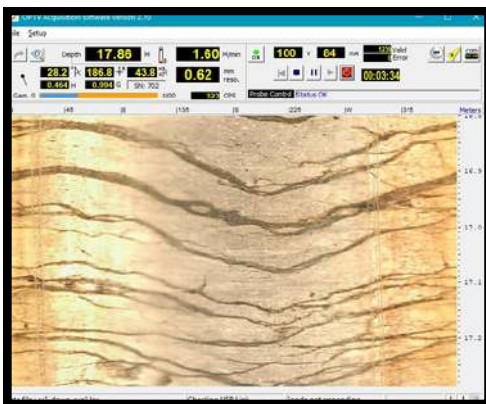
- **Diameter range:** 0 - 180° inclination 0 - 360° azimuth
- **Diameter resolution:** 0 - 360° azimuth
- $\pm 0.15^\circ$ inclination $\pm 2^\circ$ azimuth (when inclination > 3°)
- **Orientation sensor:** triple magnetometers : accelerometers

The GYR38 gyroscopic borehole deviation probe is based on a ruggedised Inertial Measurement Unit (IMU) designed from the ground up for applications in drilling and mining. This north-seeking device (for probe inclination values between 3° and 177° from the vertical) accurately provides continuous borehole trajectory data in non-vertical boreholes. A north seeking time of only 2 minutes and 60 minute measurement time between fixes both contribute to maximise operational efficiency.

- Surface Data Logger with acquisition Software
- **eMindLogger**

Key Specifications

- **Length:** 265 mm
- **Width:** 130 mm
- **Height:** 67 mm
- **Weight:** 1.5 kg
- **Logging cable length:** up to 2 500 m
- **Data transmission rate:** max 312.5 kbits/s*
- **Depth encoder comp.:** 5V/quadrature/ 1mm
- **Power supply:** 12 Vdc



***Easy and straight
forward data
acquisition interface***

The **eMindLogger** logging data acquisition module is one of the most compact and reliable available on the market. It can operate without modification on single- or four conductor logging cable and will run the full range of LIM probes including basic 6 channel, imaging probes, spectral gamma and full-wave sonic.

Connection to the logging PC or laptop is via a USB port.

The individual **eMindLogger** acquisition software packages are optimised according to the type of probe, use minimal system resources and are compatible with all versions of the Microsoft Windows® environment from Windows® XP onwards

Präsentation

Produktpräsentation und Fallstudie

● Winches and additional equipment

● Downhole logging winches

WinchLIM 150

Key Specifications

- **Cable capacity:** Max 150 m - 490 ft of 4-conductor (3/16") cable
- **Maximum winding speed:** 8 m/min - 26 ft/min
12VCC - 15 m/min - 49 ft/min 24 VCC
- **Dimensions:** 41 x 42 x 32 cm - 16.14 x 16.5 x 12.6"
- **Weight:** 15 kg -33 lbs without cable – 30 kg - 66 lbs with 150 m /492 ft of cable
- **Power supply:** 12 or 24 VDC
- **Motor power rating:** 250 W



WinchLIM 300

- **Cable capacity:** 300 m -984 ft (3/16" cable),
- **Maximum winding speed:** 20 m/min - 66 ft/min
- **Dimensions:** 52 x 45 x 57 cm - 20.5 x 17.7 x 22.4"
- **Weight:** 40 kg -88 lbs w/o cable – approx 70 kg - 154 lbs with 300 m of cable
- **Power supply:** 220 VAC
- **Motor power rating:** 300 W



- **Remonte control case**

Präsentation

Produktpräsentation und Fallstudie

- Winches and additional equipment
- Downhole logging winches

Key Specifications

- **Cable capacity:** 600 m / 1200 m - 1968 / 3937 ft (3/16" - 4Go) ,
- **Maximum winding speed:** 40 m/min - 131 ft / min
- **Dimensions WinchLIM 600:** 57 x 61 x 70 cm - 22.5 x 24 x 57.5"
- **Dimensions WinchLIM 1200:** 59 x 70 x 70 cm - 23 x 57.5 x 57.5"
- **Weight WinchLIM 600:** 75 kg - 165 lbs w/o cable – 135 kg - 298 lbs with 600 m of cable
- **Weight WinchLIM 1200:** 85 kg - 187 lbs w/o cable – 200 kg - 440 lbs with 1200 of cable
- **Power supply:** 220 VAC
- **Motor power rating:** 1200 W

WinchLIM 600 & 1200/2200



- Remonte control case

- Additional equipment

- PDS : Probe deployment system
- Weight probe
- centralizers
- encoders
- tripods
- power supply boxes
- cable heads
- formations



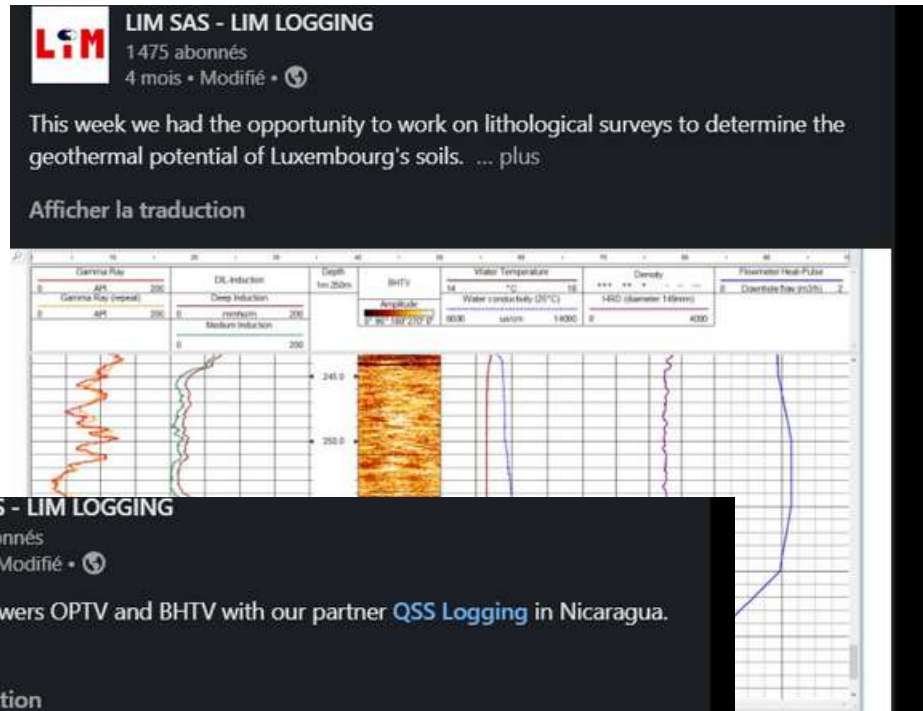
Präsentation

Produktpräsentation und Fallstudie

Ich poste regelmäßig Fotos von unseren Kunden mit unserem Material und versuche, interessante Themen aus unserem Bereich anzusprechen.

● Bilder und referenz

● **Folgen Sie auf LinkedIn: LIM SAS - LIM LOGGING**



Präsentation

Produktpräsentation und Fallstudie

- Bilder und referenz

- Einige referenz

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Geophysical Services

 GROUNDSEARCH
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- Aktuelles Projekt

- Gyroskopische Sonde
- Sonar-Sonde

Weitere Informationen finden Sie auf unserer Website :
lim.eu

Vielen Dank !