O C E A N S I S M I C A S. p. A.

WELL SITE SURVEY

PENNINA 8X

FINAL REPORT
FOR
AGIP S.p.A.

OCEANSISMICA

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1.0 **INTRODUCTION**

During the period February 22, 23, 24 1992 the OCEANSISMICA team on board of the s/v VALCADORE carried out a geophysical survey on the well site named "PENNINA 8X" approximately 24 km eastsoutheastwards S. Benedetto del Tronto town, in the Central Adriatic Sea (Fig. 1).

This report was prepared and edited in the Rome office of Oceansismica by means of an IBM 386/30 Personal Computer.

It contains a description of the survey equipment, the operational parameters and methods used for the data reduction and the interpretation of the data collected.

1.1 **Scope of work**

The scope of the survey was the investigation of the seafloor and of the sub-bottom layers in order to:

- identify the litho-morphological and bathymetrical features;
- determine the trend of sedimentary sequences;
- ascertain the presence of gas pockets and man-made objects;
- acquire any other information useful for all operations and their safety.

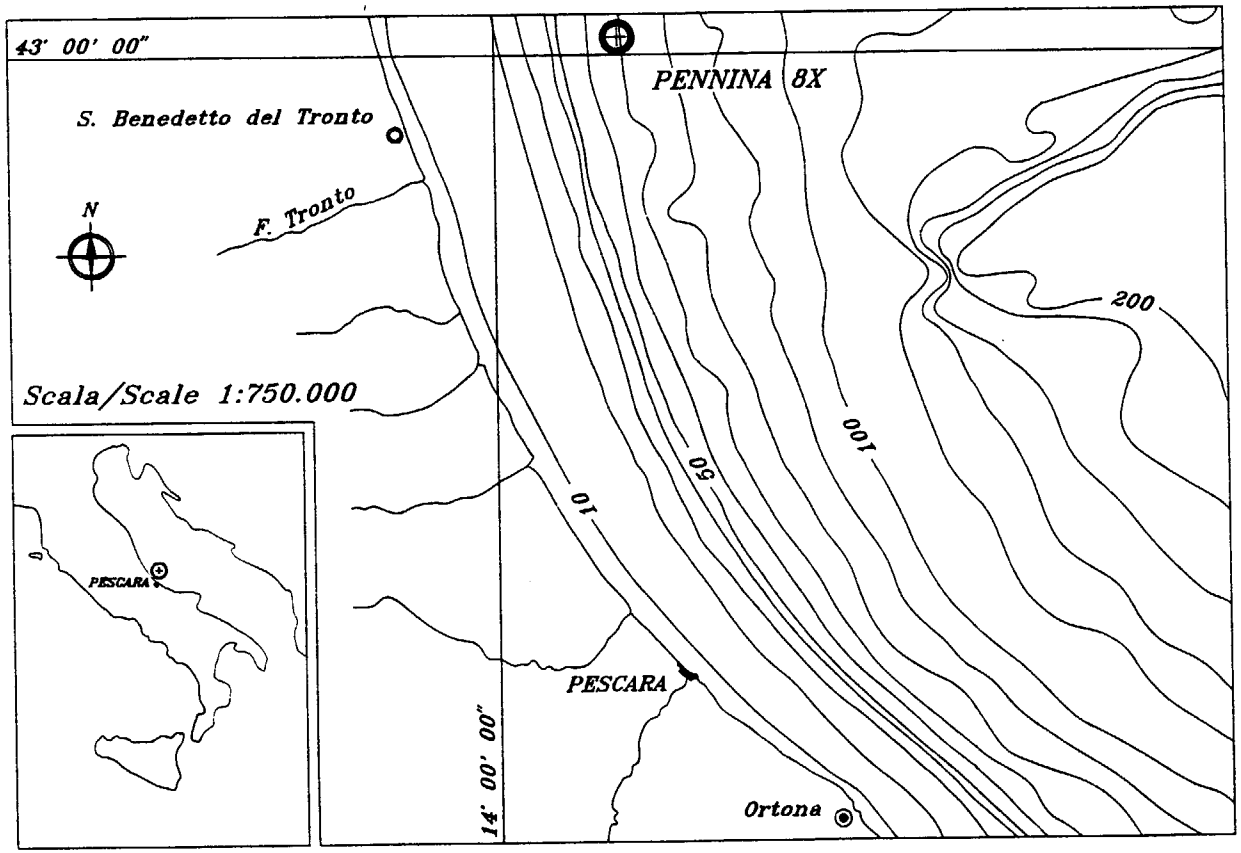


FIG. 1 – Ubicazione dell'area / Site location map

1.2 **Survey specifications and production**

The survey area is a 1.0 km x 1.0 km square area centered on the proposed well site location.

The coordinates of the proposed location are:

	GAUSS BOAGA	GEOGRAPHICAL
PENNINA 8X	2451524.9 E	Lat. 43°01'09".010
	4763371.9 N	Long. 14°09'34".850

Figure 2-a and 2-b, show the lines carried out with analog, digital and magnetometer equipment.

Figure 2-c, shows the lines carried out with digital equipment.

According to the AGIP specifications the program completed was the following:

a) 13 lines (1.2 km long) along the N-S direction spaced 50 and 100 m apart with echosounder, side scan sonar, uniboom and sub bottom profiler; 3 orthogonal tie lines spaced 200 m apart (1.2 km long) with echosounder, uniboom and sub bottom profiler.

b) 9 lines (0.65 km long) along the NO-SE direction spaced 40 m apart with magnetometer.

c) 11 lines (2.5 km long) along the S-N direction spaced 100 and 200 m apart, and 3 orthogonal tie lines (2.6 km long), spaced 400 m apart with digital seismic gear.

Three shore stations were used for the position fixing requirements (Appendix 1).

Their coordinates are :

	GAUSS BOAGA		GEOGRAFICHE
a) **TORTORETO "A"**	2431631.84	E	Lat. 42°48'11".041
	4739597.46	N	Long. 13°55'09".620
	H = 227 m		
b) **PUNTA SECCA"A"**	2427574.17	E	Lat. 42°58'21".222
	4758476.63	N	Long. 13°51'59".827
	H = 118 m		
c) **PEDASO "B"**	2425758.74	E	Lat. 43°05'20".687
	4771443.61	N	Long. 13°50'31".807
	H = 113 m		

1.3 **Survey Diary**

February 22nd 1992: Magnetometric survey

February 23rd 1992: Analog and digital analog surveys

February 24th 1992: Kullenberg gravity cores.

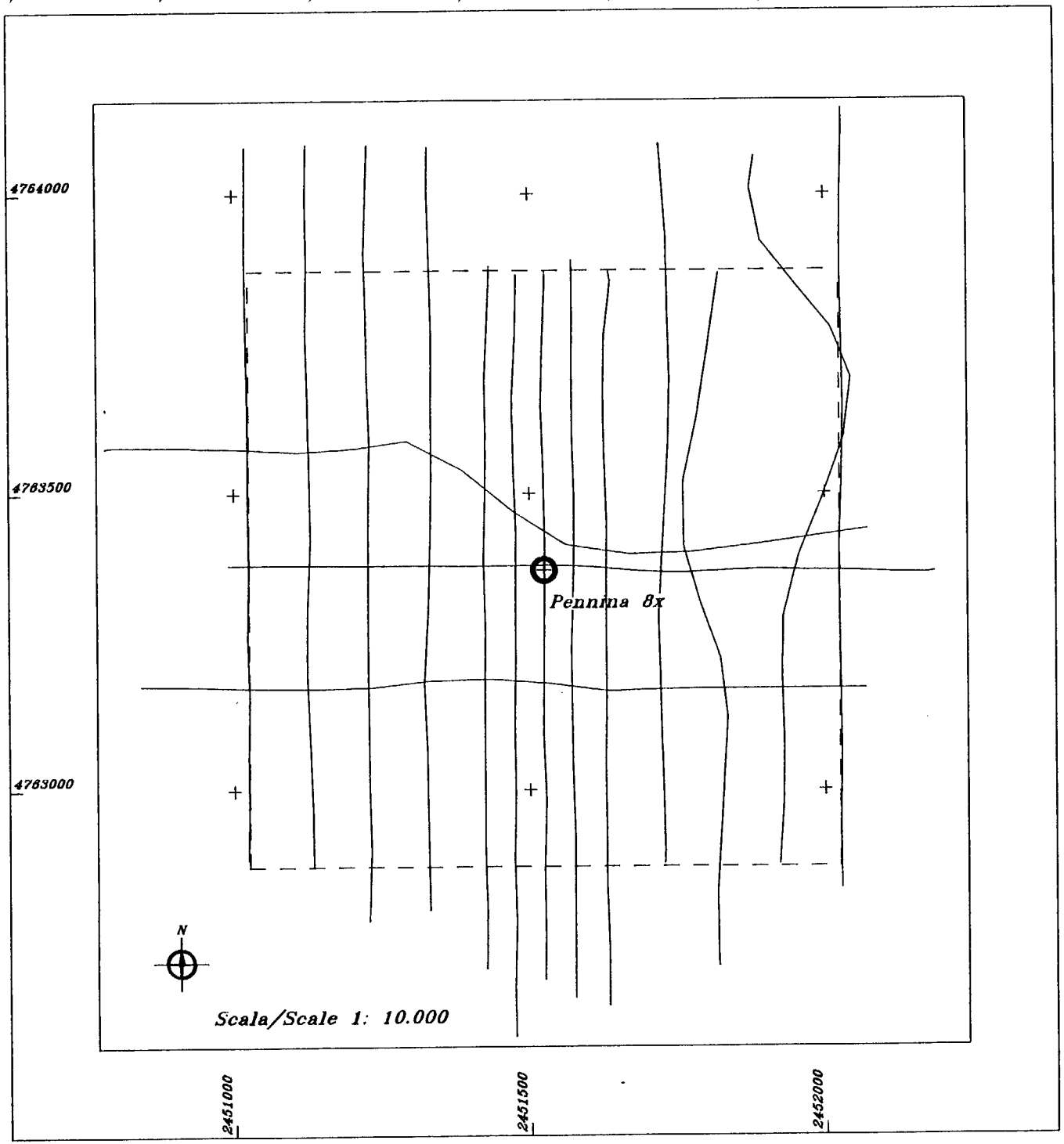


FIG 2a – Grid dei profili analogici / Grid of analog survey

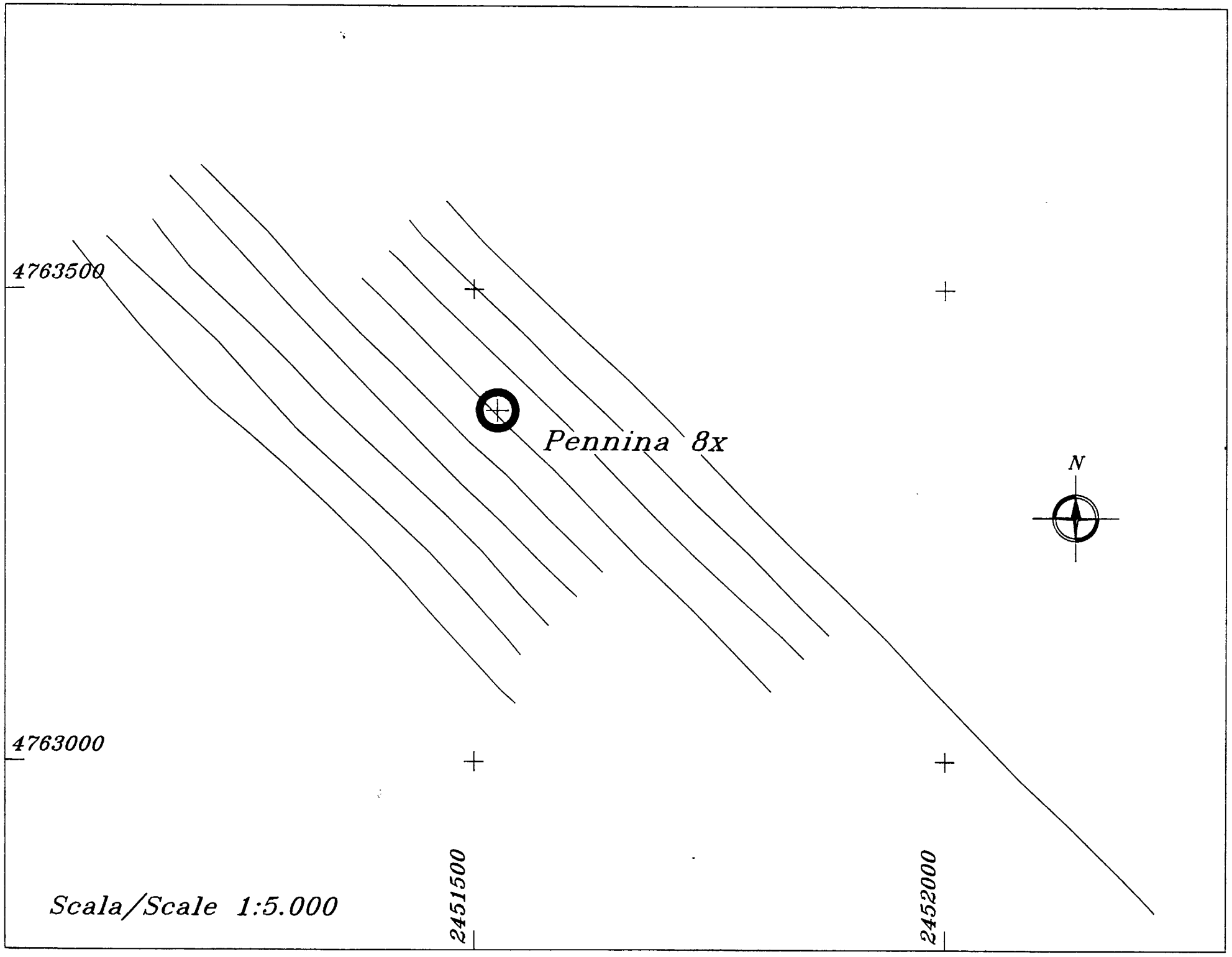


FIG. 2b – Grid dei profili magnetometrici / Grid of magnetometer survey

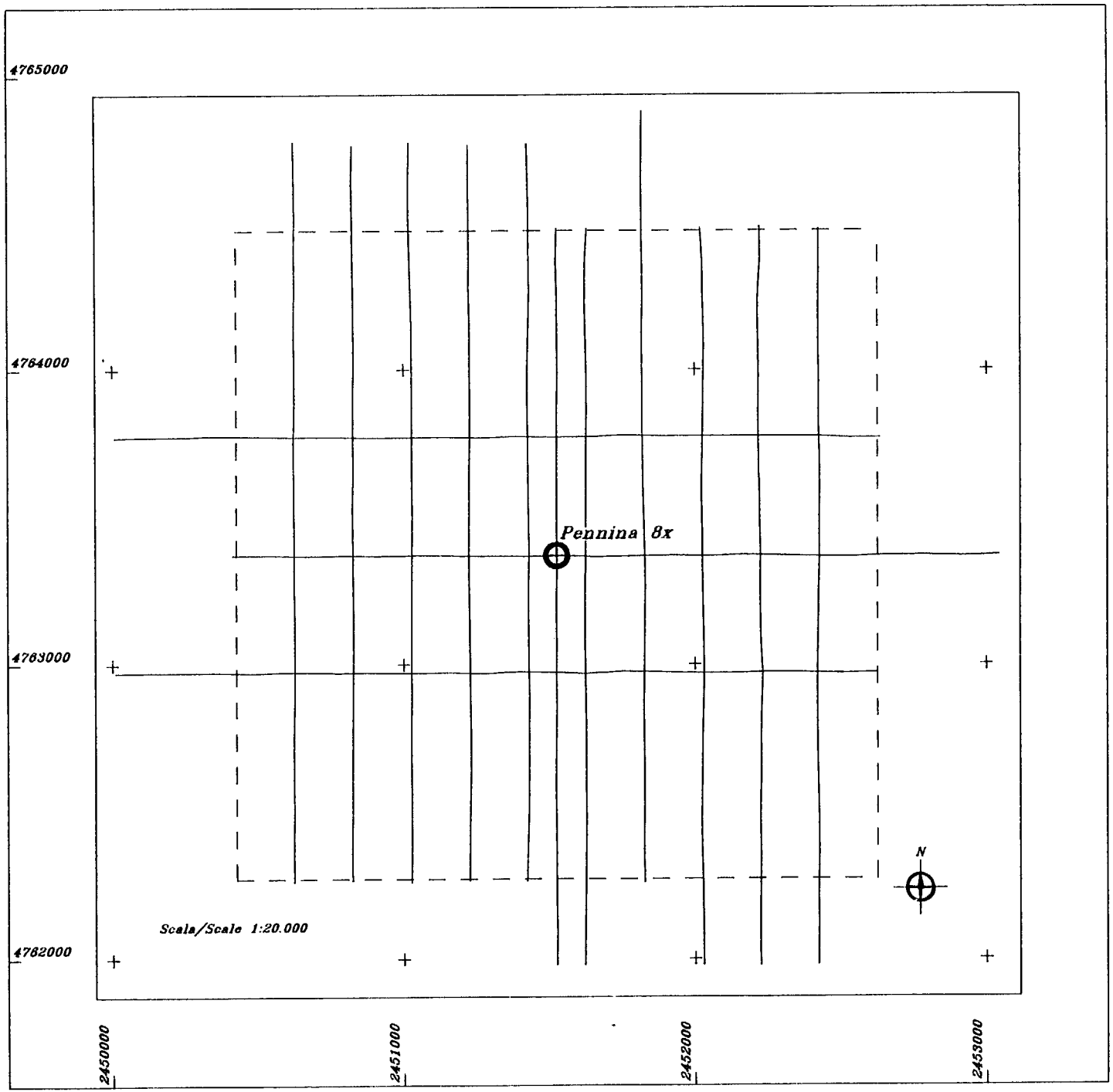


FIG. 2c – Grid dei profili digitali / Grid of digital survey

2.0 EQUIPMENT, PERSONNEL AND VESSEL

2.1 Survey positioning and data acquisition

A Syledis navigation system was used for all survey position fixing requirements.

The system consists of a Syledis consolle interfaced to a Qubit Trac IV. The Trac IV was interfaced to an HP Thinkjet printer and to an HP 9872C plotter.

The Syledis was operated in a range/range mode, interrogating three beacons at all times.

The range information was used to calculate the ship's position by means of the navigation software.

The navigation computer was interfaced to the echosounder in order to provide automatic acquisition of bathymetric data.

The navigation system produces a least-square adjusted position in Gauss Boaga and Geographic coordinates together with quality control data of least-square residuals and standard deviation.

The Gauss Boaga Projection used are International Spheroid, Monte Mario Datum and Central Meridian of 15 degrees.

Position fixing was initiated by the navigation computer on distance based calculations at intervals of approximately 100 m for the analogue survey and 125 m for the digital survey.

A hard-copy print-out of all relevant navigation / echosounder data was produced on the HP Thinkjet printer

and simultaneously logged on a flexible disk for post plotting.

Fix closures for both analogue and digital seismic records were triggered by the navigation system via a relay box.

The helmsman received all necessary information for the accurate steering of the ship from a remote visual display installed on the bridge.

At the end of the survey, post-plotting of the navigation data was completed on board by means of an HP 9872C plotter.

During data acquisition a record annotator TSS 312B has been used. This instrument writes down the lin number, the date and the fix numbers on every record.

The annotator is directly connected with the navigation computer and send all the informations to the echosounder, side scan sonar, sub bottom profiler, uniboom and magnetometer.

2.2 **Echosounder**

For the automatic acquisition of bathimetric data an Elac Laz 721 dual frequency (30-200 KHz) hydrographic echosounder was used, coupled to the positioning system via a digitizer.

The system utilises two transducers, operating at frequencies of 30 kHz and 200 kHz simultaneously, with an accuracy within 0.5% of the recording range.

The transducer housing was mounted on a special over the side rig, welded to the port side of the vessel with an immersion of 2.00 m below the water surface.

The recorder's zero line was adjusted to compensate for the depth of the trasducers below the sea surface and the echosounder was calibrated for the correct speed of sound in water by means of a bar-check carried out at depths of 10 and 20 metres at the start of the survey period.

In order to record the correct depth, the echosounder was adjusted for a velocity of sound in sea water of 1500 m per second.

2.3 **Side Scan Sonar**

The survey was carried out with a EG&G mod. 260 Side Scan Sonar provided with an automatic image correction.

This system comprises a ballasted "tow-fish" containing two laterally mounted 100 and 500 kHz transducers, 1000 metres of armoured logging cable on a power winch, a transceiver and a EG&G 260 three channels recorder.

This modern system has more advantages comparing to traditional model, for example a thermal printer, connections with navigation computer, magnetic recording unit, the annotator and the speed log.

The transducer housing consists of a streamlined, hydrodynamically balanced body, about one meter long,

containing two sets of transducers which scan (impulse between 0.1 and 0.01 msec) the seafloor on both sides of the ship's track.

The ultrasonic beams are slightly depressed from the horizontal with the axis of the main lobes pointing 10 degrees downwards to ensure a high resolution.

The horizontal beam-width is narrowed down to 1.2-0.5 degrees in order to ensure a reasonable transverse resolution even at the longest range.

The signal returns from the seafloor to the transducers and the acustic impulses are converted in electrical signals, processed and recorded either on paper or on floppy disks. Each returning signal is plotted on the graphic recorder, at the position corresponding to the time it was received after the outgoing pulse. The bidimensional image formed in this way is defined by a high number of lines (800 pixels per channel); every line is constituited by points whose intensity is proportional to the strength of the return signal that represents the properties of the seafloor materials as well as its morphology.

The gain and AGC controls are used to optimize the record quality.

Theorical precision of the system is about 1 % of the range used, while its resolution is 1 pixel (1/800 of the range).

The range used, according to specifications, is 100 m per channel.

This provides a theoretical 100% overlap of seafloor coverage with a line spacing of 100 m.

In order to optimize the recordings the fish is towed as close as practicable to the optimum height above the sea floor corresponding to 1/10 of the scale used.

2.4 **Sub bottom profiler and Uniboom**

An O.R.E. Bottom Profiling System and a Uniboom system were used as the analogue reflection seismic source during the survey.

A - The O.R.E. High Power Multi-Frequency Sub-Bottom Profiling System is designed to obtain a very high resolution of the first sub-bottom.

It consists of a side mounted transducer array with working frequencies between 2.0 and 7.0 kHz, and a related beamwidth variable from 55 to 30 degrees.

An O.R.E. model 140 transceiver, coupled to the transducers, allows the control of several parameters, such as frequency, gain, energy level, bandwidth, etc.

Output power is adjustable between 0 and 10 KW during the key-pulse with operating frequencies varying from 1 to 12 KHz.

The receiver input sensitivity is about 30 microvolt RMS.

Records are obtained by transmitting high-power pulses of acoustic energy from the group of transducers mounted on an over-the-side rig fixed to the hull of

the vessel so that the plates of the transducers are supported at approximately one meter below the water level.

Penetration and reflection are dependant on the properties of the sub-bottom materials, as well as on the power and carrier frequency of the signal.

The reflected pulses are detected by the same acoustic transducer used for trasmission and the resulting electrical signal is recorded on a precision graphic recorder "EPC model 3200 S".

B - An E.G.& G. Uniboom (Unit Pulse Boomer) system was also used as the analogue reflection seismic source. Its consist of a towed sound source, an electrical power supply, a towed hydrophone array and a graphic recorder, a filter section and a TVG amplifier.

The sound source provides a very sharp, clean acoustic signal due to discharge of a capacitor bank (E.G. & G. Power Supply Mod. 232-A, 231-A Trigger Capacitor Bank) in a mechanical transducer.

The maximum rated input to the sound source is 300 watt at 4 KV.

The electromechanical sound transducer is mounted on a catamaran and is designed to operate with the EG&G capacitance Energy Sources, Seismic Recorder and matching Hydrophone streamer.

The unique electromechanical assembly consists of an insulated metal plate and rubber diaphragm adjacent to a

flat-wound electrical coil. A short duration, high power electrical pulse discharges from the separate Energy Sources into the coil and the resultant magnetic filed explosively repels the metal plate. The plate motion in the water generates a single broad band acoustic pressure pulse.

The sound pulse is normally shorter than 0.2 milliseconds, with an output (at 300 W) of 107 db/microbar at 1 meter.

The frequency spectrum of the output varies with the input power but ranges between 400 Hz and 1800 Hz and no cavitation, reverberation or bubble effects.

Penetration of the impulse in the sub-bottom greatly depends on the seabed characteristics.

The typical penetration into no gas-charged sediments ranges from 10 up to 40 m; in favourable conditions highes values, up to 100 metres, can be achieved.

The theoretical resolution of the system is of the order of a few centimeters, but it is greatly influenced by the characteristics of the receiver and the techniques employed in towing.

The reflected acoustic pulses were detected by means of a E.G. & G. Mod. 265 Single Channel Hydrophone towed from the aft of the boat deck.

This arrangement mantains the hydrophone cable at a depth of approximately 0,5 metres in the quietest water available, on the apposite side of wake from the source,

thereby minimising the effects of the sea surface return and of the direct wace, and reducing the strenght of the first seabed multiples, by scattering the energy in the wake.

The active section of the hydrophones cable contains 15 piezo-electric sensing elements, the signals from which are summed to produce an enhanced, single-channel output. This output was subjected to 30 db of preamplification and filtering using a Geomarine band-pass filter and TVG.

2.5 **DELPH 1 Digital monotrace seismic acquisition / processing System**

The Uniboom and Uniboom seismic data were recorded and processed with the following digital seismic system :

HARDWARE

- Hyundai At/386 processor, 80387 coprocessor
- Special acquisition/processing board
- 100 MByte hard disk
- Backup streamer
- Tiga Video board
- NEC MultiSync 4D high resolution display
- OYO electrostatic plotter

ACQUISITION SOFTWARE PERFORMANCE

- Sampling frequency: 1 to 40 KHz
- Recording: 2048 samples (in ms: 2048/sampling frequency)
- Shooting rate: 125 ms minimum
  25 ms more than the acquisition time (with storage on hard disk)
- Programmable gain: 0 to 48 dB
- Quality control: Spectral analysis of data
- Real time digital processing and plotting

PROCESSING SOFTWARE PERFORMANCE

- Filtering (linear phase filters: Low pass, High pass)
- Automatic gain control (exponential or linearadaptive gains
- Time variable gain
- Stacking
- Swell compensation
- Variable setting of vertical and horizontal scales

2.6 **Magnetometer**

The magnetometer we normally use is a M 123 Barringer magnetometer.

Resolution output (1 gamma) depends on the sampling rate chosen. Readings can be printed and traced simoultaneously by the strip chart recorder.

They can be plotted at different scale factors to ensure the stylus will continue scale, the other will continue to trace the readings on the same paper sweep but at a higher scale factor.

All of the functions of the magnetometer, including the recorder, are controlled by microprocessor electronics.

2.7 **Digital multitrace seismic system**

The survey was carried out with the following seismic system :

1) Texas Instruments "DFS V" digital acquisition system.

2) Water gun energy source.

3) Twenty four trace streamer system.

1) Digital acquisition system

The "DFS V" is a digital seismic recording system with a high level of reliability.

Its main advantages are :

- High sampling rate
- Complete testing facilities. Allowing for the detection and displaying of errors in 66 conditions.
- Decimal value reading.
- Compact size and light weight.
- Low power consuption.

The "DFS V" employed consists of three main sections:

a) Analog module

b) Control module

c) Two Tape transports

a) Analogue module

In relation to the number of seismic channels used and on the basis of sample rate, it is possible to use

one or more analog modules.

One module configuration has been used during this survey because only 48 seismic channels were required.

Signals coming from the streamer are fed to the analog module where they are filtered, preamplified and multiplexed.

Cable test facilities are also provided.

b) Control module

This control module controls the whole system (tape transports, analogue module, recording and sample times), and converts the incoming seismic signals into the correct digital format ready for recording on tape.

Playback and monitoring on an electrostatic camera can also be selected when required.

Particularly important are the auxiliary functions which are provided by the DFS V: time break, data filters, frequency reference, shot point seismic amplifier, auxiliary channels.

Time break is used to determine the true shot instant and coincides with the "start of data" on tape.

One of the six data filter channels (with the same filter setting of the seismic channels) was employed to obtain the "signature"; the signal arriving at the hydrophone placed near the source gave an indication of the frequency response and spectrum.

The signature was memorised and compared.

By means of the auxiliary channels (four in the

configuration used) it was possible to make simultaneous tape and camera recordings of:

- Time break on aux. channel 4
- Signature on aux. channel 2
- Reference frequency on aux. channel 1
- Water break amplifier on aux. channel 3

The electrostatic camera, a OYO FIELDGRAPH DFM 250 used in this survey, provided an instantaneous check of tape recording quality.

A simultaneous analogue recording was also required. This was obtained by means of an EPC model 3200S dual channel graphic recorder, which recorded the signal from one of the 48 seismic channels of the DFS V.

c) Tape transports

Two automatic tape transport modules were used allowing all seismic and test data to be recorded in SEG B - 1600 bpi format.

2) Energy Source

The water gun energy source utilised for the digital data acquisition with a 400 cubic inches S.S.I.

The system is energized by an hydropneumatic power system capable of 3000 psi and can fire at rates up to 4.0 seconds.

The acoustic energy released into the water is obtained from air under high pressure admitted into the

gun through a hose and stored in the upper chamber.

Pops are obtained by energizing with a short electrical impulse the electromagnetic valve through an electrical line.

Water contained in the firing chamber rushes out through the two parts, generating an acoustic signal of implosive type.

3) Seismic Streamer

The seismic streamer used to detect the reflected pulses is a 48 traces Litton with Teledyne hydrophones.

It consists of 100 meters of stretch section and 600 meters of active sections.

Each active section contains four data channels with a group of 20 hydrophones each.

The distance between two adjacent trace centers is 25 meters.

Three depth sensors were included in the streamer, forward of channels 1, 25, and after channel 41, to monitor head and tail depths of the cable.

Also three depths controllers and three water break amplifiers were utilized.

2.8 **Gravity corer**

The instrument consists of a steel pipe 3 m long with a 65 mm diameter containing a core liner.

A 400 Kg cylinder weight with stabilizing fins provides the push to sink the corer into the sediments.

2.9 **Oceansismica personnel**

- F. ZUCCHINI : Party Chief

- G. GALASSO : Senior surveyor
- A. EVANGELISTI : Senior surveyor

- C. LUNCEFORD : Water Gun engineer
- A. SCOTTO : Junior engineer

- R.J. DICKSON : Senior engineer
- P. WRIGHT : Senior engineer
- F. DI CARLO : Junior engineer
- F. OCCHIENA : Junior engineer

- F. CIOCCI : Land station attendant
- F. SGAMBATI : Land Station attendant

- AGIP S.p.A. Representative : Mr. L. ALBERICO

2.9 **Survey Vessels**

For the survey was utilized the s/v "VAL CADORE", an italian flag survey vessel supplied by AGIP, whose main characteristics are the following:

Length	65.25 m
Beam	13.95 m
Draft	5.35 m
Gross tonnage	1280.00 tons
Engines	4 WARTSILA VASA 8R22HF 6420 BHP

3.0 **OPERATIONAL PARAMETERS AND METHODS**

The geophysical equipment was employed with the configuration shown in Figg. 3-a/b with the following operational parameters:

a - Syledis: the radio positioning system was calibrated before the beginning of the job on the baseline

BASE AGIP "PIOMBONI" - BERTINORO (37807.6 m)

b - For the Echosounder, calibrated before the beginning of the job by bar-check, a speed of sound of 1500 m/s and a scale 0 - 100 m were used.

The recorder zero line was adjusted to compensate for the depth of the transducer below sea level.

c - The Side Scan Sonar was employed with a scale of 100 meters per side and the tow-fish was kept at a distance from the ship and from the antenna, varying according to the water depth (in this case is of about 195 m).

d - The Sub Bottom Profiler (3,5 KHz) has been fired every 1/8 second, with an energy output of 7 KW.

e - The Uniboom (300 Joules) was fired every 500 milliseconds and was towed 30 meters behind the vessel.

f - The Magnetometer sensor was towed at a distance of 200 m from the ship at altitude of some meters from

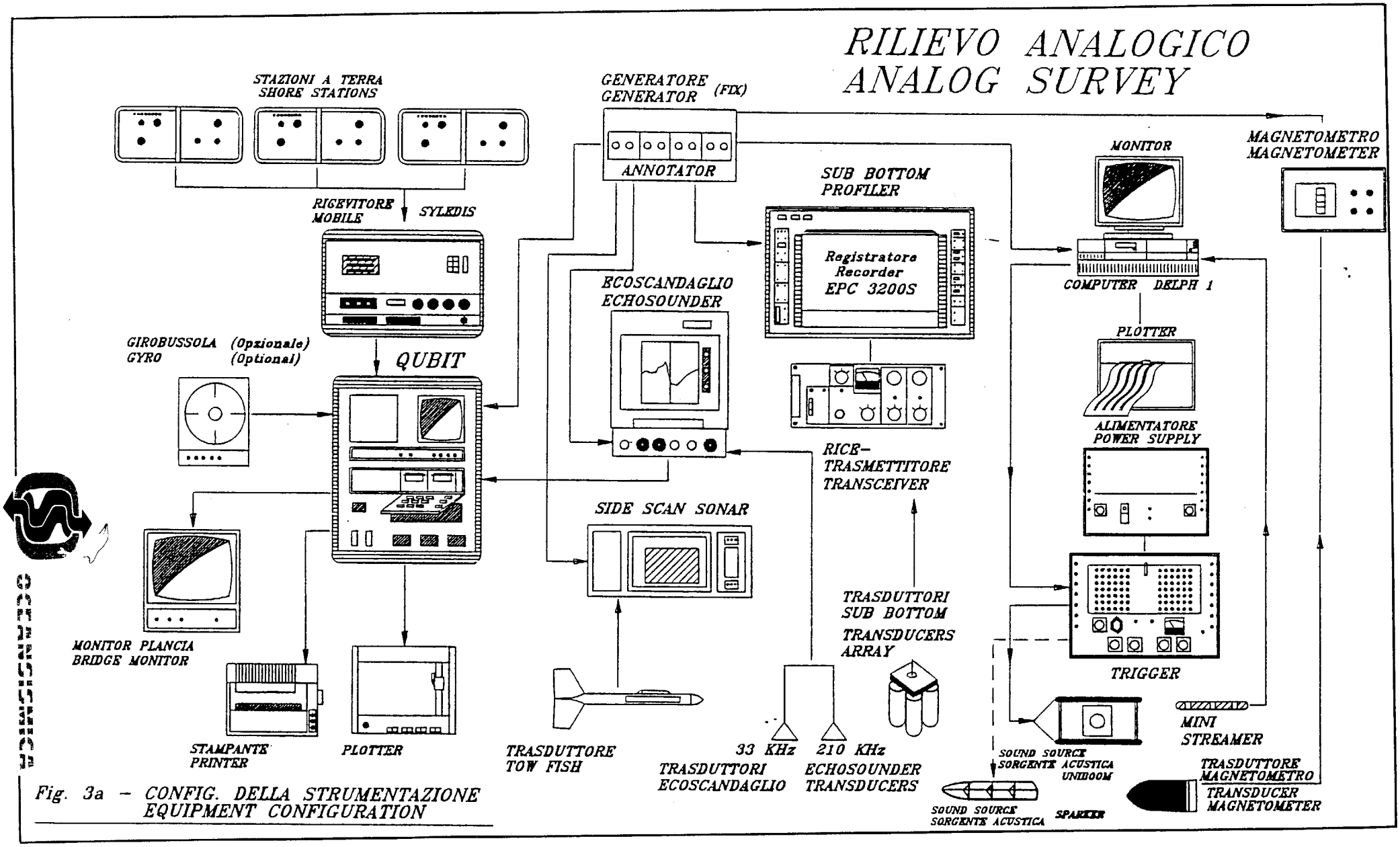


Fig. 3a – CONFIG. DELLA STRUMENTAZIONE
EQUIPMENT CONFIGURATION

RILIEVO DIGITALE / DIGITAL SURVEY

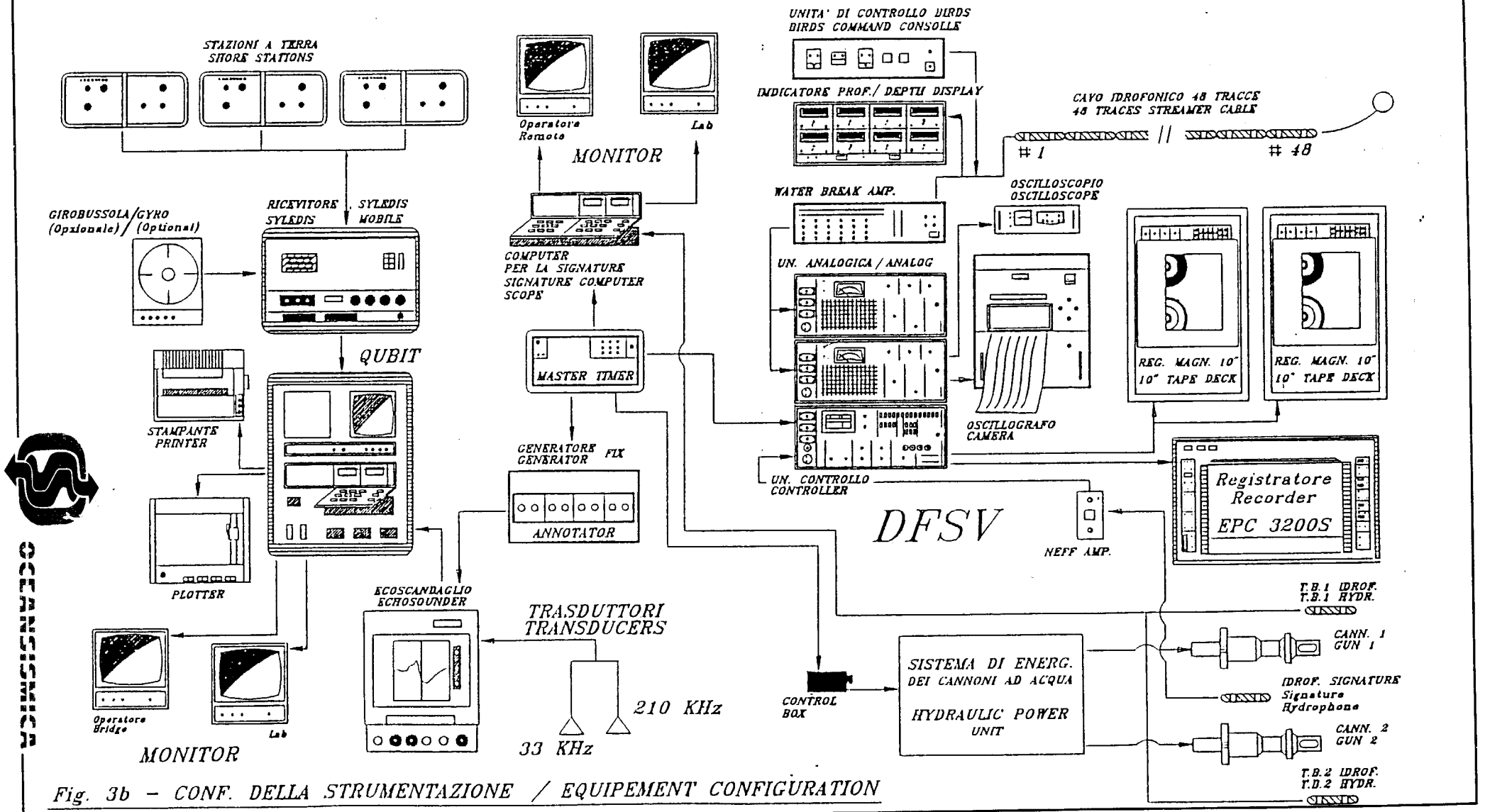


Fig. 3b – CONF. DELLA STRUMENTAZIONE / EQUIPEMENT CONFIGURATION

the sea floor. The sensitivity used was 1 gamma.

g - The power source for the seismic survey was a 400 c.i. Water Gun towed, approximately 3-4 meters below the surface.

The Streamer, mounted on a power winch, was towed from the center of the stern.

The layback from the antenna to the N.C.D.P. was **107.5 m.**

The navigation system provides the control for shot points at the required 12.5 metres interval.

Each closure activates a "multifix box", whose outgoing signal is simultaneously sent to the D.F.S.V control unit and to the "fix marker" of the echosounder and of the EPC graphic recorder.

Record length and sample rate are set to 2.0 seconds and one millisecond respectively, as required by the specifications.

At the start of each line the surveyor takes a fix and starts the shot firing sequence of 10 shots per 125 meters.

The observer logs the line, tape and file number, streamer depth, water depth, as well as misfires, parity errors, and any other anomalous events.

The final fix at the end of each line was taken 600 meters beyond the edge of the survey area in order to ensure full fold coverage of the required line length.

At the end of each line the fire command to the gun

was disabled and a noise test recorded on tape before shutting down the tape transports and turning the vessel towards the run-in for the next line.

As each line was completed its details were logged in the production log and the tapes were labelled and boxed for despatch.

On completion of the required programme the magnetic tapes of seismic data, the navigation map, the digital logs, etc. were freighted to the processing center.

The towing configuration is shown in Figg. 4-a/b.

RILIEVO ANALOGICO
ANALOG SURVEY

LEGENDA

ANTENNA RADIOPOSIZIONAMENTO	1
SUB BOTTOM PROFILER	2
ECOSCANDAGLIO	3
MINISTREAMER	4
SIDE SCAN SONAR	5
UNIBOOM	6
MAGNETOMETRO	7
CAMPIONATORE	8

LEGEND

1	RADIOPOSITIONING SYSTEM ANTENNA
2	SUB BOTTOM PROFILER
3	ECHOSOUNDER
4	MINISTREAMER
5	SIDE SCAN SONAR
6	UNIBOOM
7	MAGNETOMETER
8	CORER

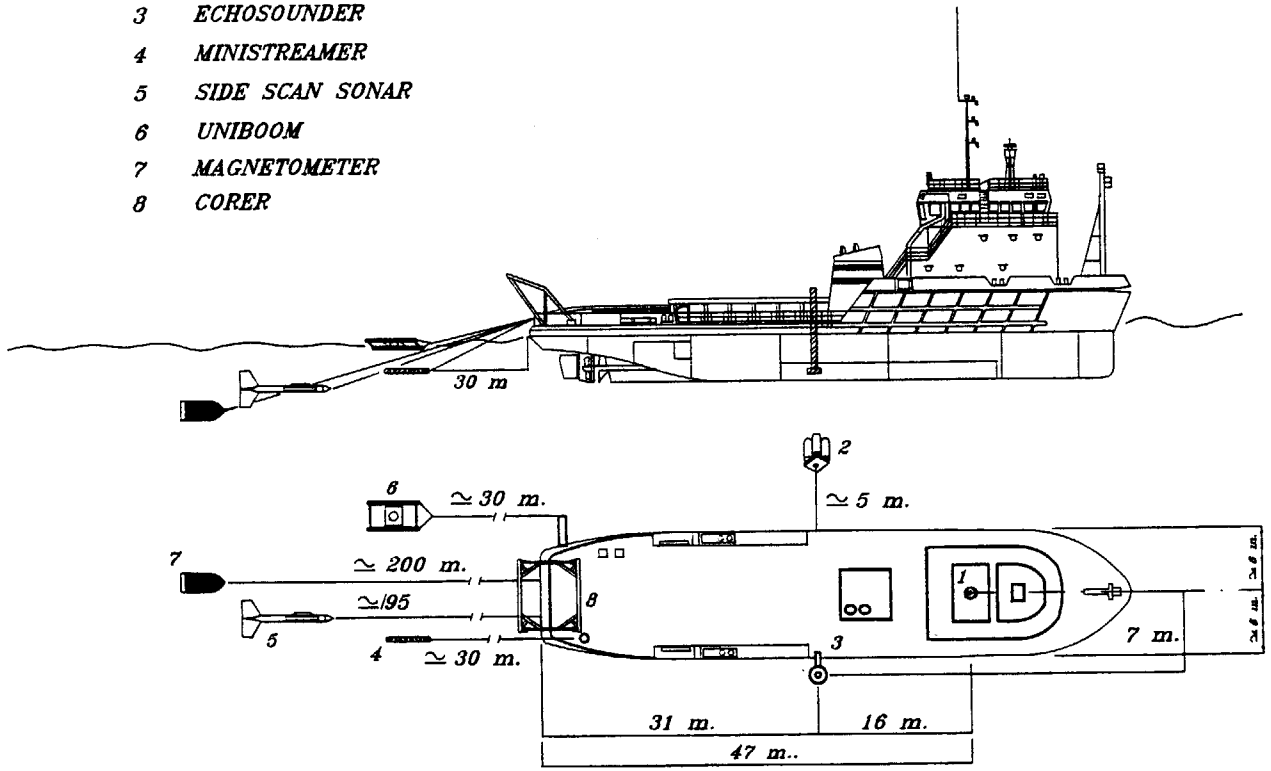


Fig. 4a – DIAGRAMMA DEGLI OFFSET / LAYBACK DIAGRAM

RILIEVO DIGITALE
DIGITAL SURVEY

LEGENDA		LEGEND
ANTENNA RADIOPOSIZIONAMENTO	1	RADIOPOSITIONING SYSTEM ANTENNA
ECOSCANDAGLIO	2	ECHOSOUNDER
SORGENTE ACUSTICA	3	ACOUSTIC SOURCE
CAVO IDROFONICO 48 TRACCE	4	48 TRACES STREAMER CABLE

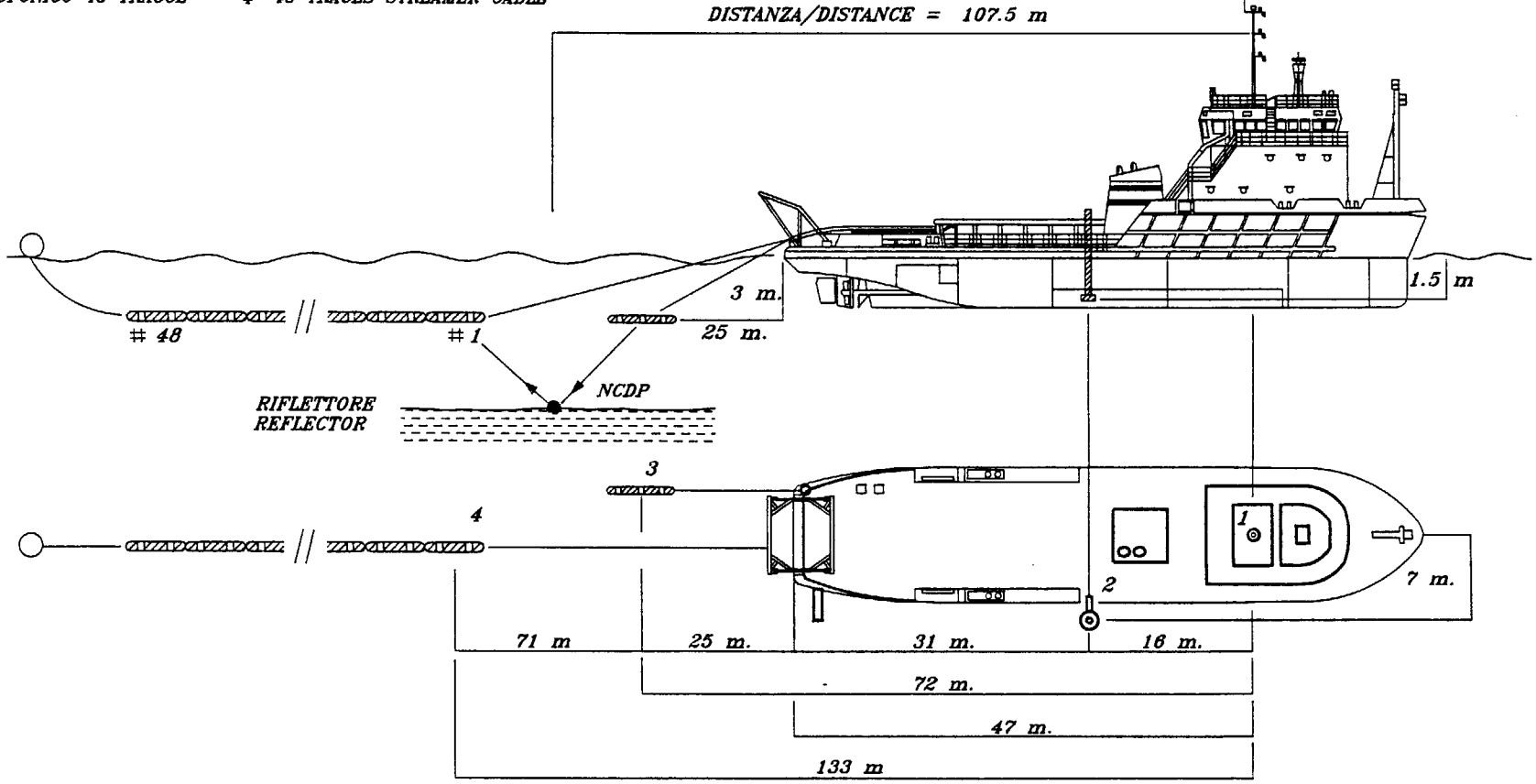


Fig. 4b – DIAGRAMMA DEGLI OFFSET / LAYBACK DIAGRAM

OCEANOGRAFICA

4.0 GEOLOGICAL FRAMEWORK

The surveyed area is located in the middle Adriatic sea where a very thick sequence of quaternary and pliocenic sediments overlies the Adriatic carbonatic platform.

The Pliocene base should be found at a depth not greater how 3000 m.

The pliocenic sediments are constituted by clayey sequence where is possible to have the occurrence of more compact sands included in the shale sequences.

The geological situation could favour the accumulation of gas in the pliocenic-quaternary sediments as a conseguence of gas migration from deep seated deposits.

The sand layers with higher porosity may be saturated by gas migrating from the deeper layers.

Multiple gas pools are therefore probable below smoothed anticlines of tectonic or stratigraphic origin and represent a hazard to the drilling operations.

The quaternary sequences are clays, silts and sands subparallel to weakly discordant.

During the last period of the Pleistocene, at the time of the sea regression corresponding to the peak of the Wurmian glacial period, the present day continental platform of the upper Adriatic sea was a large plain cut by the old beds of the rivers that presently reach the coastline.

The Flandrian transgression brought the sea to invade the Wurmian fluvial-swampy plain during two main episodes.

The first one occurred approximately 6000 years ago and brought the coast line about 25 m below the present day sea level; the second one occurred from 2000 to 3000 years ago and represents the largest sea advance of Holocene time.

At the end of the Flandrian transgression the present day sedimentation pattern set in and produced the large blanket of fine materials overlying the flandrian sediments and the build-up of the deltas.

5.0 DATA REDUCTION AND RESULTS

5.1 **Navigation**

The recorded navigation data were used to produce a track plot at a scale 1:5000 for the analog, digital and magnetometric survey, and at a scale 1:10000 for the digital survey.

These survey track charts are presented as enclosures 1 and 2 of this report and contain start of line, end of line and all fix points along each survey line with their progressive number annotated.

The plotted fixes for the analogue and digital survey correspond respectively to the antenna position or to the N.C.D.P.

5.2 **Bathymetry**

The echosounder records are of good quality and no problems were encountered with the equipment during the survey.

An example of echosounder record is shown in figure 5.

A correction for the depth of the transducer below sea level was applied to the echosounder, so that true water depths could be scaled directly off the echograms and accurate depth information logged by the navigation computer.

The digitized depth data were monitored and checked against the echosounder analogue records to confirm the

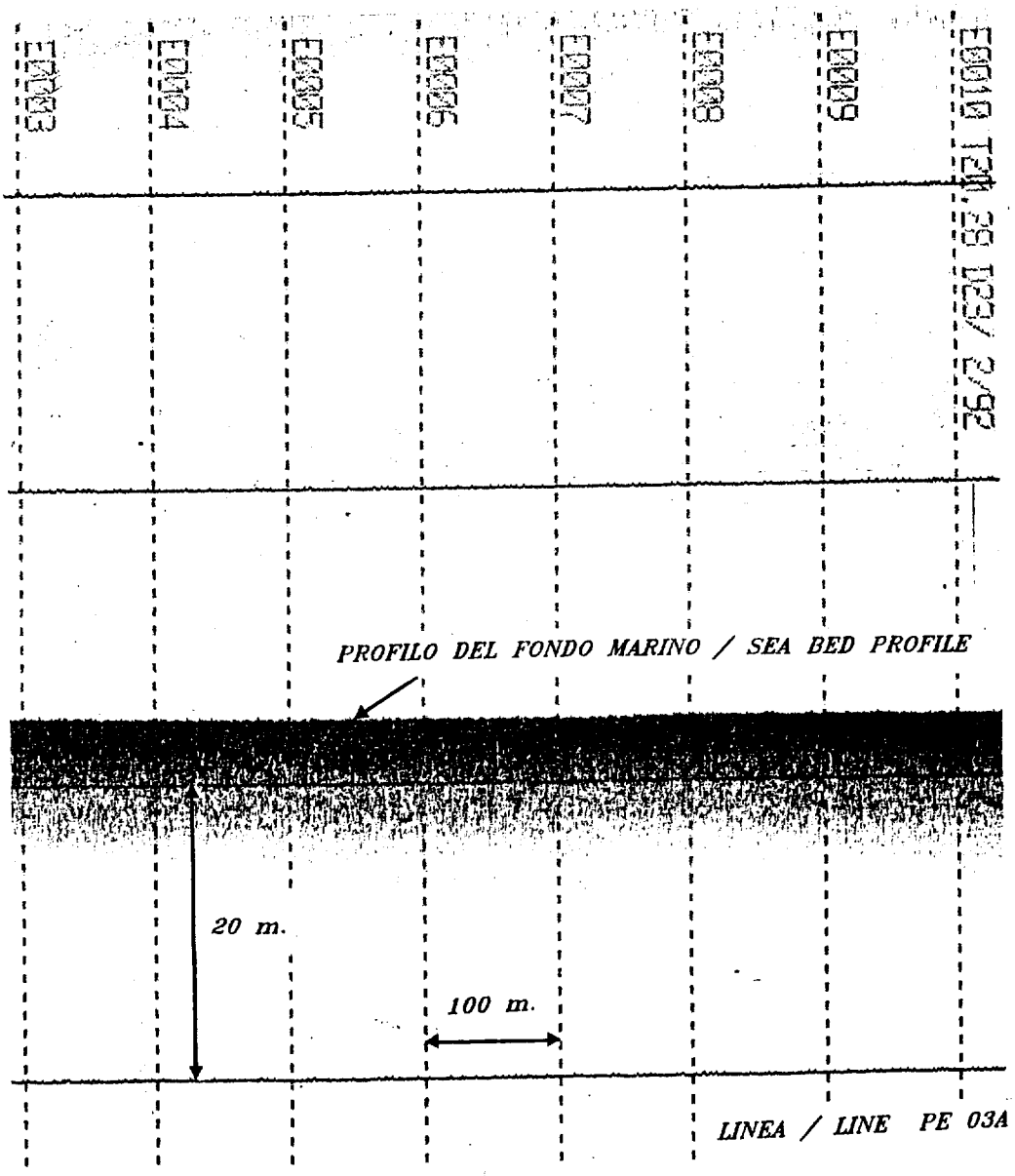


Fig. 5 – ESEMPIO DI REGISTRAZIONE BATIMETRICA
EXAMPLE OF ECHOSOUNDER DATA

truthful character of any salient seafloor features.

The datum selected is the Mean Low Water Spring (M.L.W.S.); this datum, defined by the "Istituto Idrografico della Marina", is related to a constant conventional level, called "level of reduction of soundings".

The observed water depths range between 74.8 m and 77.7 m. At the proposed well site the water depth is approximately 76.3 m.

The seafloor in the survey area, becomes deeper Eastwards with 0,26% slope.

Enclosure 3 (1:5000 scale) shows the bathymetric map and the proposed well site location.

5.3 **Seafloor features**

The side scan sonar data are of good quality. An example of a S.S.S. record is shown in figure 6.

The Seafloor shows a regular and uniform morphology; seabottom is covered by generally homogeneous fine grain size sediments.

Side scan sonar records show the presence of Pennina platform with the following coords:

	GAUSS-BOAGA	GEOGRAPHICAL
PENNINA	4763536 N	Lat. 43°01'14".450
	2451858 E	Long. 14°09'49".516

Starting from this platform a pipeline goes straight eastwards.

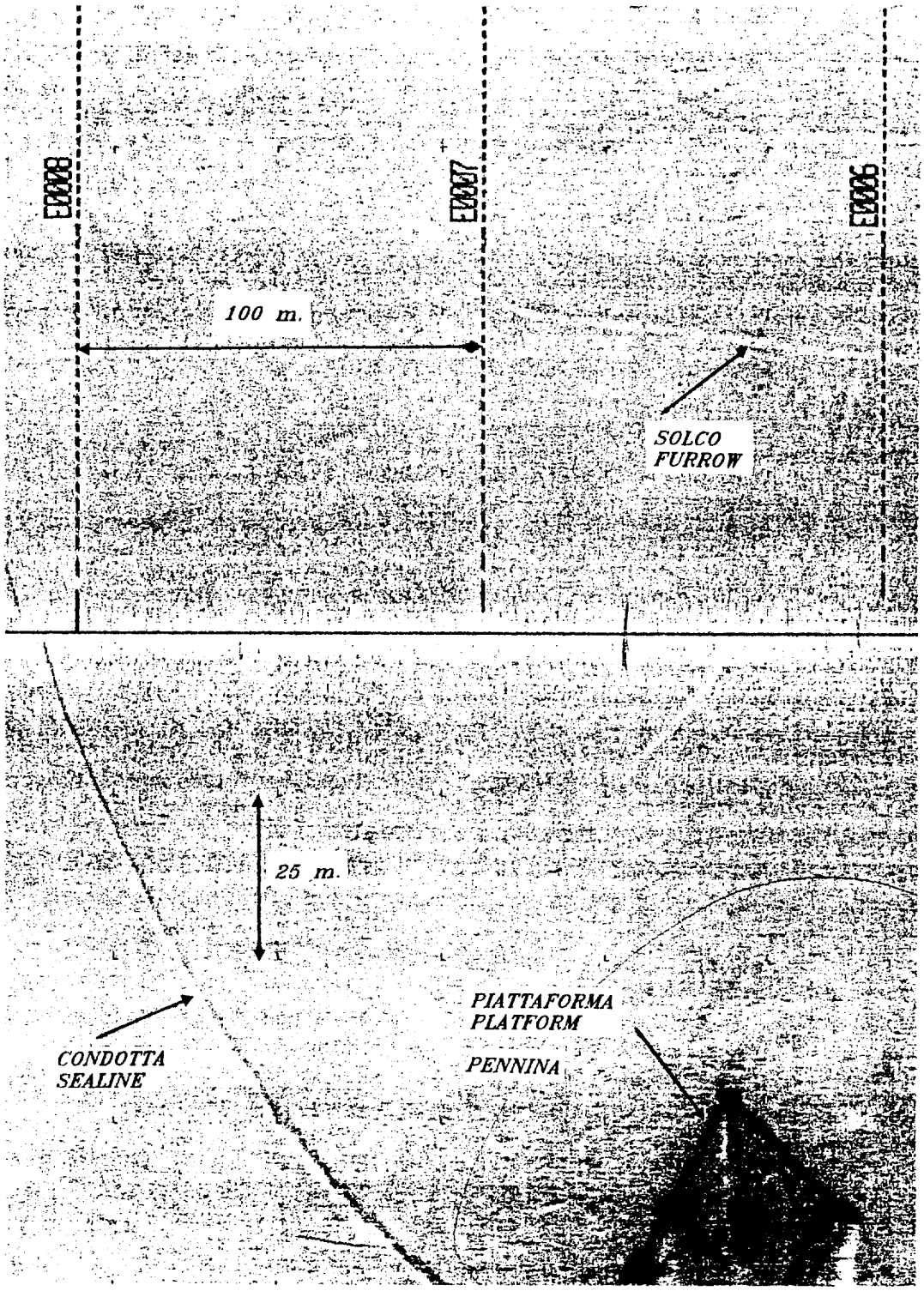


Fig 6 – ESEMPIO DI REGISTRAZIONE A SCANSIONE LATERALE
EXAMPLE OF SIDE SCAN SONAR DATA

LINEA / LINE PE 11A

Scattered all over the area furrows due to anchors dragging and fishing activity have been detected.

Aproximately 600 m South-Southeastwards of Pennina 8x some jack up prints have been detected.

5.4 **Sub-Seafloor Features**

The S.B.P. and Uniboom records are of good quality.

For the calculation of the reflectors' depth and the thickness of the sedimentary units, a speed of sound in sediments of 1615 m/s has been assumed.

Sub Bottom Profiler data

The top sediments below the seafloor have been investigated by the low frequencies (3.5 KHz) of the sub bottom profiler.

The penetration of the S.B.P. signal reached approximately 27 m below sea-floor. The vertical resolution has been as high as some decimeter.

Three shallow seismic horizons are detectable in the whole area. Their depths are at 11.2-12.0 m, 13.5 m and 15 m below seafloor.

The first seismic horizon (R1), detected about 11.2-12.0 m below the seafloor, is generally sub-parallel to the bottom but presents some discontinuities. This seismic unit is made of clayey sediments as confirmed by the collected samples.

The second seismic horizon (R2), located about 8.5-9.1 m below the seafloor and the third one (R 3),

located aproximately 15 m below the seafloor on the whole are regular and sub-parallel to the first one but not continuous.

The sediments, below R1, are probably coarser of the previous ones and consisting of fine sands and silts.

No gas anomalies were detected in the area.

Examples of sub bottom profiler data are shown in Fig. 7.

Uniboom data

The Uniboom data confirms the situation shown by the sub bottom profiler.

The penetration of the Uniboom signals reaches about 70 m below the seafloor.

The vertical resolution confirms the described sedimentary structures.

Three more reflectors sub parallel to the seafloor hav e been detected at a depth respectively of :

R 4 17.6 m

R 5 21.6 m

R 6 56.2 m

An example of Uniboom record is shown in fig. 8.

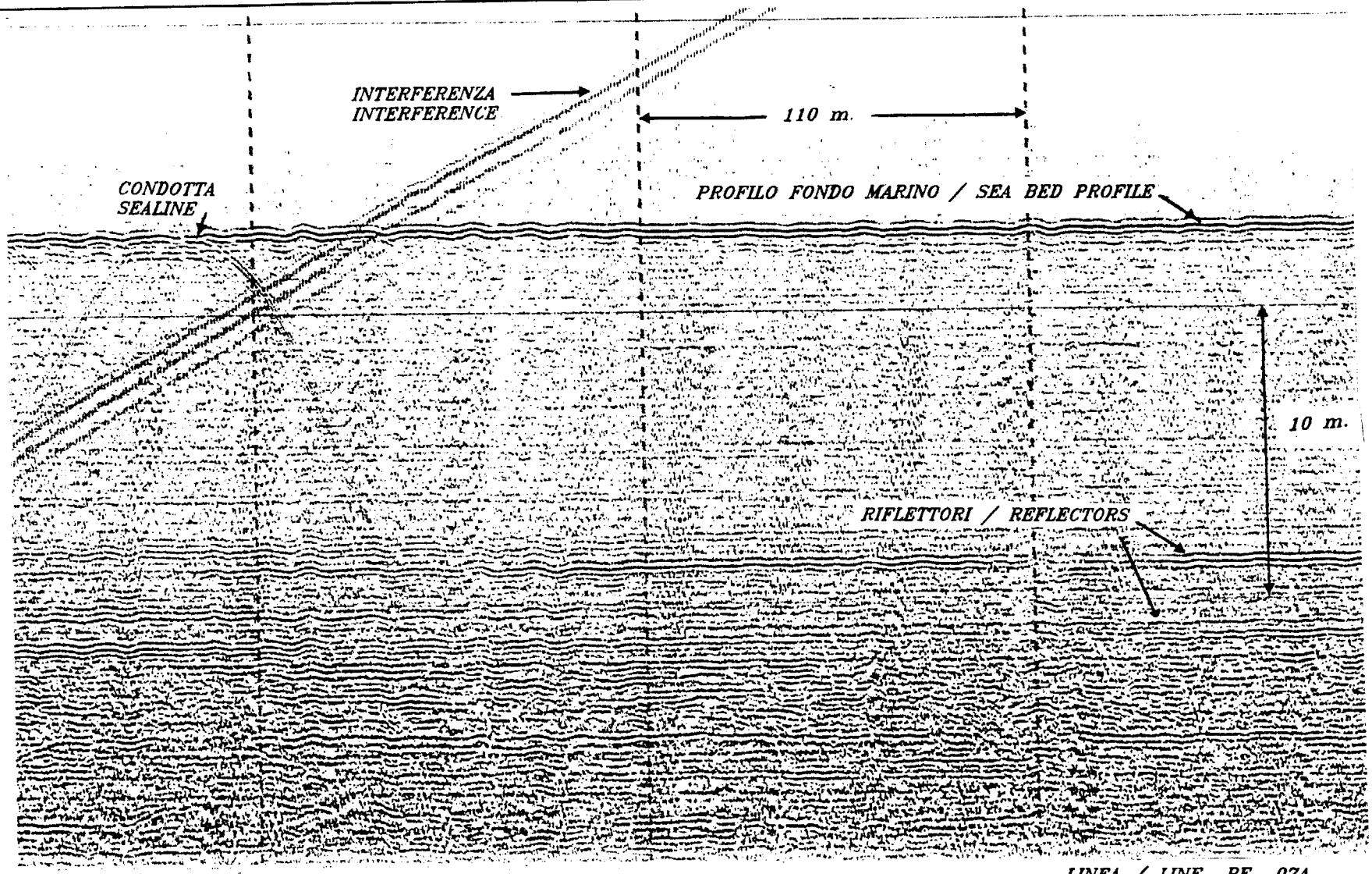


Fig. 7 – ESEMPIO DI REGISTRAZIONE DEL PROFILATORE DI SEDIMENTI
EXAMPLE OF SUB BOTTOM PROFILER DATA

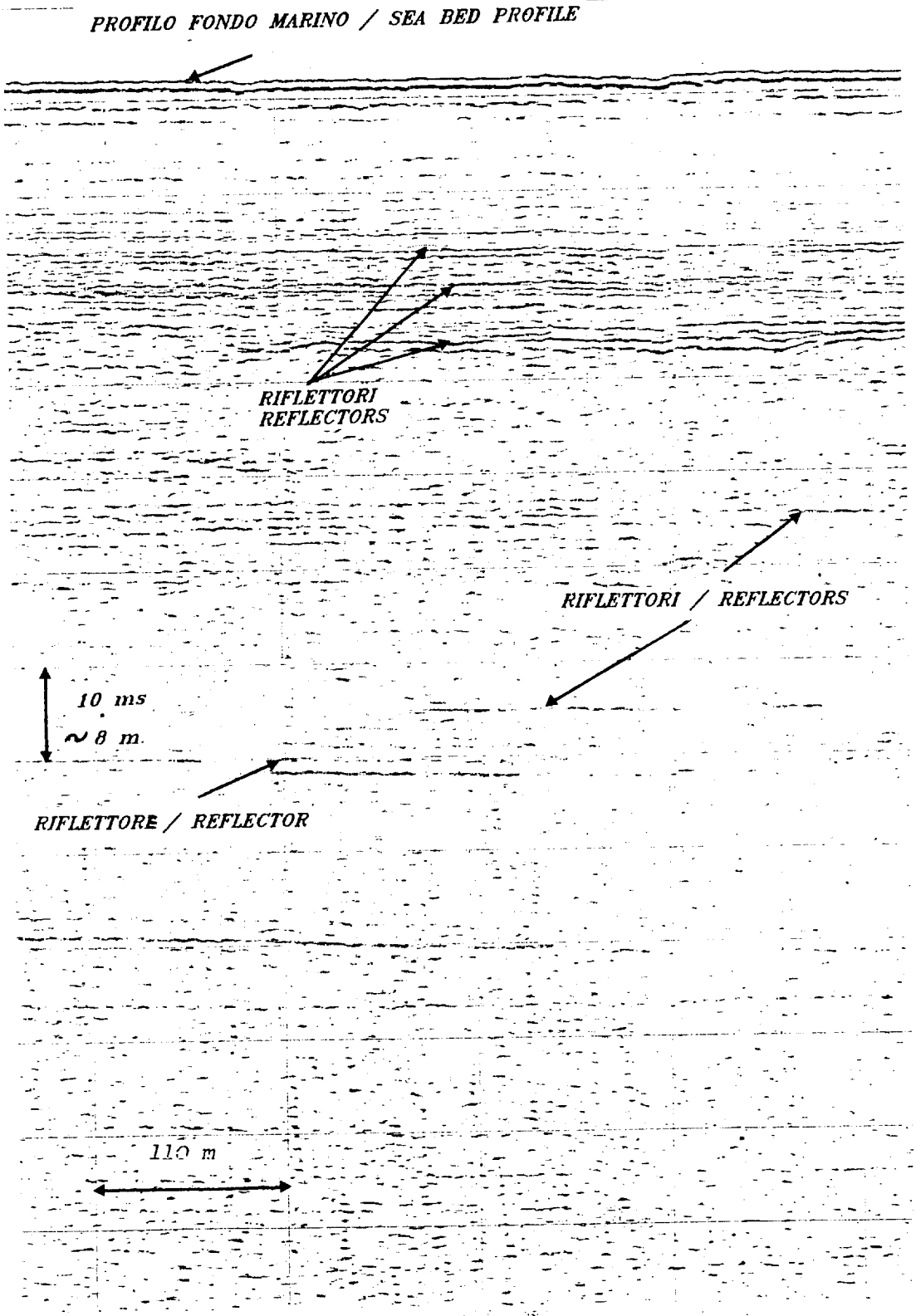


Fig. 8 – ESEMPIO DI REGISTRAZIONE UNIBOOM LINEA / LINE PE 07A
EXAMPLE OF UNIBOOM DATA

5.5 **Magnetometer**

The magnetometer records are of good quality. An example of record is shown in Fig. 9.

The magnetometer data analysis did not reveal any ferromagnetic anomalies but those referrable to the present platform (PENNINA 8X).

5.6 **Core Samplings**

In order to identify the lithology of the seafloor, four bottom samples were collected near the proposed site by means of a gravity corer.

The samples recovered consist of cohesive clayey sediments.

The co-ordinates of the coring location (shown in enclosure 3), are the following:

	GAUSS BOAGA		
K 1	E 2451538.58 N 4763430.23	**K 3**	E 2451424.59 N 4763290.44
K 2	E 2451469.96 N 4763372.43	**K 4**	E 2451548.60 N 4763372.45

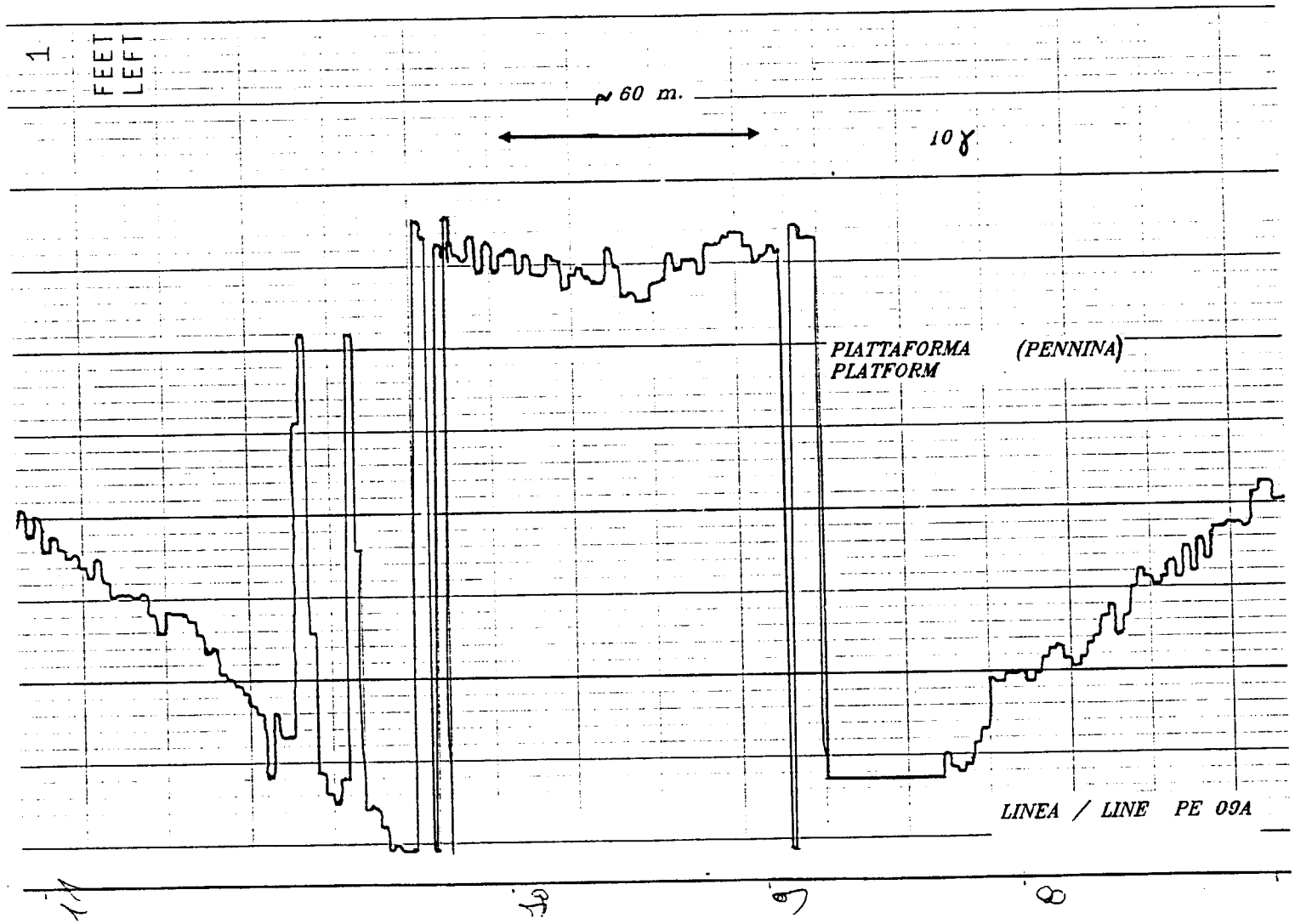


Fig. 9 – ESEMPIO DI REGISTRAZIONE MAGNETOMETRICA
EXAMPLE OF MAGNETOMETER DATA

6.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the bathymetric survey show a regular seafloor which becomes deeper Eastwards with a gradient of 0.26%.

The depth at the centre of the area is 76.3 m ; at the four corners is the following:

Northeastern corner: .....77.7 m

Northwestern corner: .....75.1 m

Southeastern corner: .....77.6 m

Southwestern corner: .....74.8 m

The Side Scan Sonar records reveal a seafloor free from both natural and man-made obstacles. Pennina Platform and the pipeline starting there southwestwards ha ve been detected and mapped: Pennina platform is located aproximately 400 m northeast of Pennina 8x.

The bottom is probably covered by a blanket of fine grained clayey-silty sediments as shown by cores too.

The seismic stratigraphy shows six sub-parallel reflectors at a depth of 11.5 m (R 1), 13.5 m (R 2), 15.0 m (R 3), 17.6 m (R 4), 21.6 m (R 5) and 56.2 m (R 6) below seafloor (mapped in Enclosure 4).

Considering the interpretation results, none of the elements detected should create problems to well site future location.

Magnetometric survey didn't reveal any ferromagnetic anomalies but those referrable to the present platform and pipeline (Pennina).

A P P E N D I X 1

SHORE STATIONS DESCRIPTIONS

OCEANSONICS

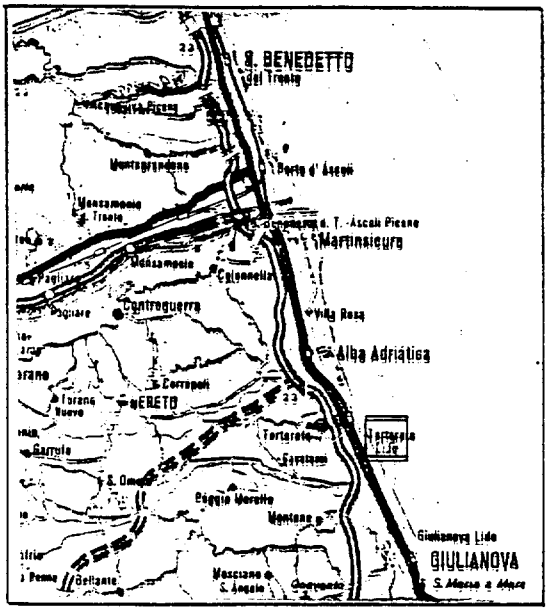
OCEANSISMICA

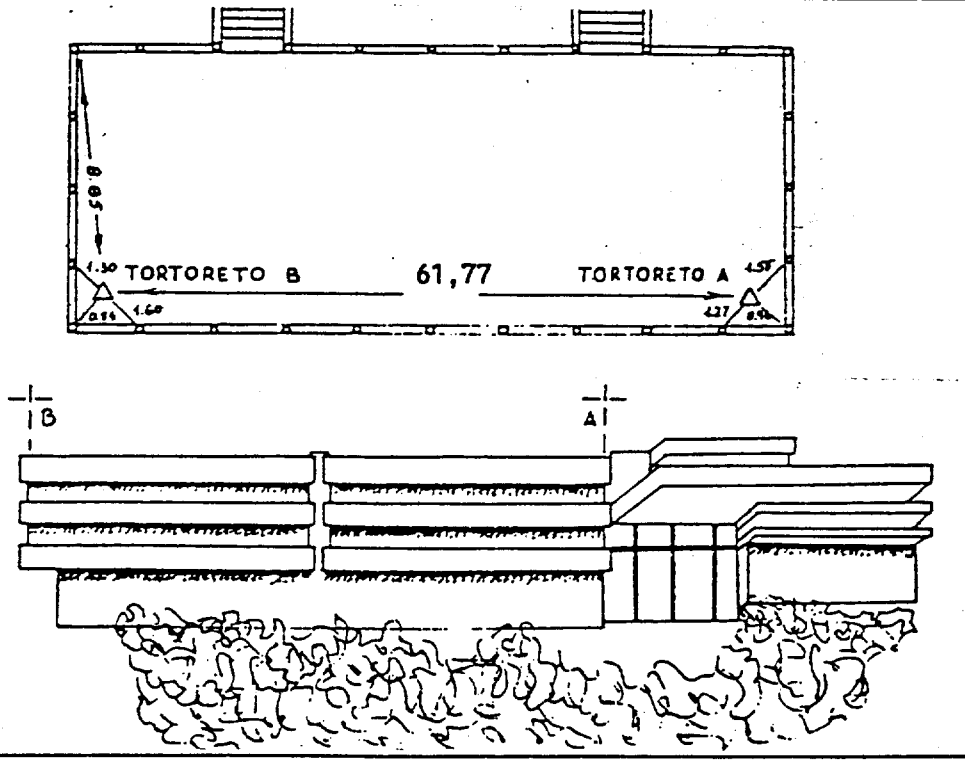
Comune Teramo — Localita' Tortoreto Alta

Monografia del punto Tortoreto "A" e "B"

Descrizione del punto:

Da Pescara percorrendo la S.S. 16 in direzione di Ancona,al Km.403 in prossimità di Tortoreto Lido,salire per Tortoreto Alto,i punti sono situati sul terrazzo del belvedere di proprietà del comune.





Coordinate geografiche
(riferite a Greenwich)

Lat. 42° 48' 11".041
Long. 13° 55' 09".620

Coordinate Gauss-Boaga
(riferite al Fuso Est)

Est 2431631.837
Nord 4739597.464

Quota s.l.m.:metri 227.155

Pianta:

Tortoreto punto " B "

Lat. 42° 48' 09".052
Long.13° 55' 09".307

E 2431623.956
N 4739536.197

Quota s.l.m.:metri 227.155

Distanza inclinata:Torre Cerrano "B" e Tortoreto "B":metri 27781 (misurata mediante tellurometro).

Aero S.r.l. ATTIVITÀ AEROPORTUARIE

Comune PEDASO Località Semaforo Marina

all. 6b

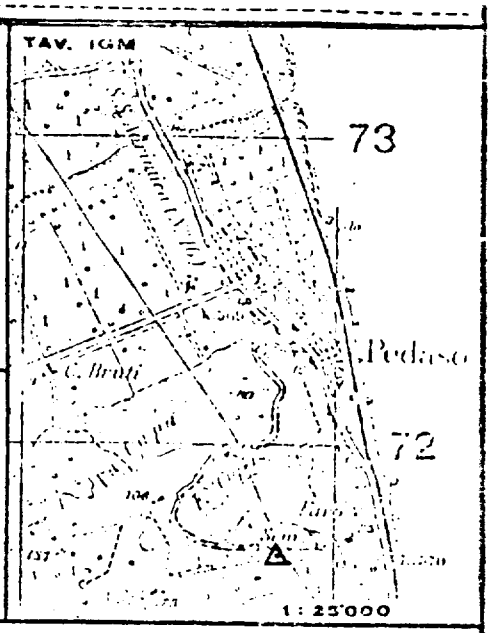
Monografia del punto P E D A S C A e B

DESCRIZIONE DEL PUNTO

Il punto di Pedaso A si trova al centro del terrazzino più alto della rimessa di attrezzi agricoli che si trova sopra il paese di Pedaso a circa 200 m. dalla Marina Militare all'incrocio con la strada che dalla Marina sale verso S-V.

Il punto B trovasi sulla mezzeria del terrazzino 2 m. più basso del primo ed è in allineamento con il lato Sud del primo.

TAV. IGM



Coordinate Gauss-Boaga (E.I) : Punto A EST = 2.425.756,54 NORD = 4.77I.444,42

Coordinate Geografiche : LONG. = I3° 50' 3I",709 LAT. = 43° 05' 20",7I2

Quota s.l.m. = mt. II5

VEDUTA PROSPETTICA

Il punto B ha le seguenti coordinate:

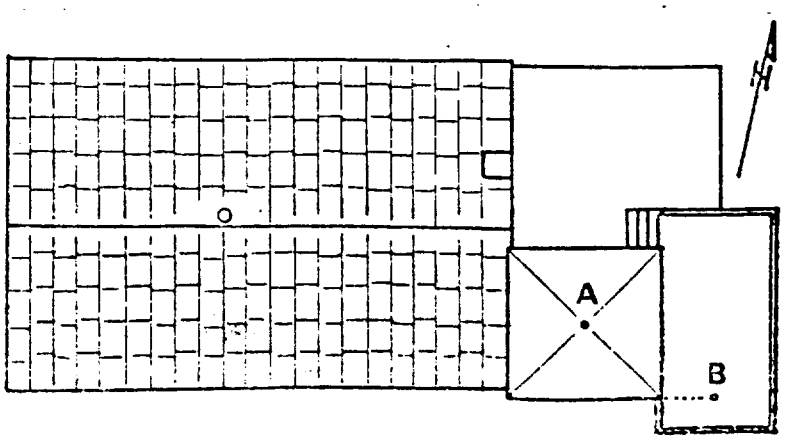
E = 2.425.758,74 Long. = I3° 50' 3I",807

N = 4.77I.443,6I Lat. = 43° 05' 20",687

Quota = m.II3

FOTO PANORAMICA

PIANTA



AGIP SpA
Attività Minerarie

PUNTO PEDASO A e B

N°

COMPILATO DA

RICOGNIZIONE DEL

RILIEVO DEL

F. I.G.M. 100000 N°

PROPRIETARIO ED AUTORIZZAZIONE

Il proprietario della rimessa é il sig. Bruti Ubaldo abitante a Pedaso nella casa a sud della stazione di rifornimento Agip.

Per accedere ai punti basta avvertire il suo salariato che é nella casa a monte più vicina.

ACCESSO

Ai punti si accede dal paese di Pedaso per la strada che sale verso il semaforo della Marina.

DETERMINAZIONE TOPOGRAFICA DEL PUNTO

Il punto é stato determinato per intersezione inversa dai punti trigonometrici IGM di Massignano, Campofilone, Lapedona, Altidona e Monte Capo D'Arco.

ANNOTAZIONI

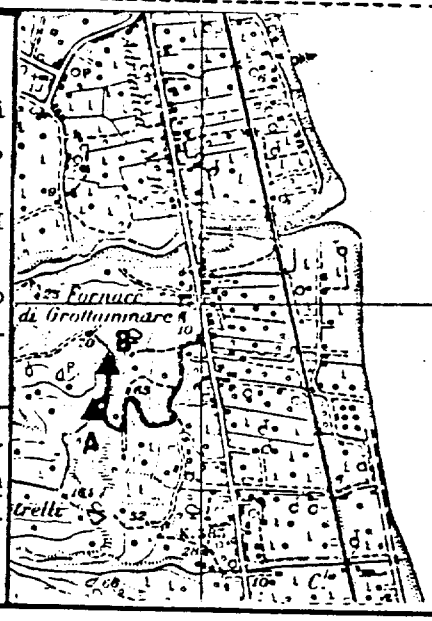
Agip S.p.A.
ATTIVITA' MINERARIE

Comune S. BENEDETTO **Localita'** PUNTA SECCA

Monografia del punto PUNTA SECCA AGIP A e B

DESCRIZIONE DEL PUNTO

I nuovi punti sono stati determinati nei pressi dell'ultimo tornante sinistro della strada che, salendo ancora in quota , conduce al punto Perotti AGIP ed al traliccio ripetitore della RAI che si erge alla sommità di un colle a circa 5 Km. a Nord/Nord Ovest di S.Benedetto del Tronto Il punto A è stato ubicato all'interno del tornante mentre il punto B è stato posizionato al termine di una carrareccia che parte dall'esterno del tornante.Entrambi i punti sono stati segnalizzati con dei picchetti in ferro e risultano ripristinabili utilizzando i riferimenti come da monografia.



Coordinate Gauss-Boaga (E.I) : Punta Secca "A" **EST=** 2.427.574,17 **NORD =** 4.758.476,63

Coordinate Geografiche : **LONG=** 13°51'59",827 **LAT. =** 42°58'21",222

Quota s.l.m. = mt. 118

VEDUTA PROSPETTICA

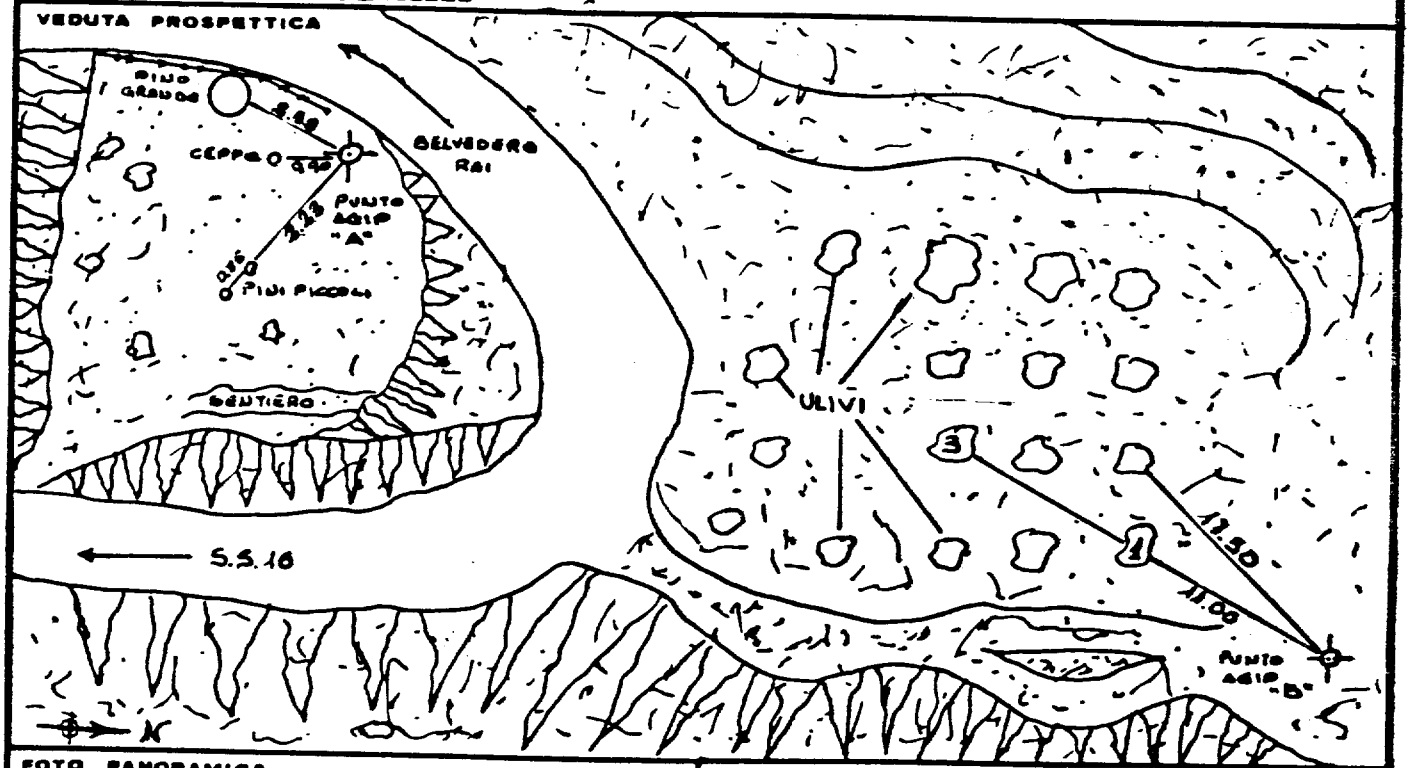


FOTO PANORAMICA

PIANTA

Agip S.p.A
Attività Minerarie

PUNTO PUNTA SECCA A e B

N°

COMPILATO DA
[illegible]

RICOGNIZIONE DEL

RILIEVO DEL 15/9/83

F. I.G.M. 100000 N° 133

PROPRIETARIO ED AUTORIZZAZIONE

Sig. PEROTTI ANTONIO
TEL 0735/581138
VIA MONTESECCO, 1
63013 GROTTAMMARE (AP)

ACCESSO

Da S. Benedetto percorrendo la S.S. 16, al Km. 382,40 in direzione di Ancona, prima di raggiungere la fornace di Grottamare, si svolta a sinistra imboccando una stradina in asfalto, stretta che salendo in quota conduce al traliccio ripetitore della RAI.
Nei pressi del penultimo tornante sinistro di detta strada, prima di raggiungere l'antenna della RAI, sono stati ubicati i due nuovi punti come si può vedere dal disegno della monografia.

DETERMINAZIONE TOPOGRAFICA DEL PUNTO

I punti sono stati determinati per Azimut e Distanza del trigonometrico AGIP, Punto PEROTTI e con orientamento ai trigonometrici IGM di Colonnella, Acquaviva Picena e Torre Grisostomi AGIP.

PUNTO A: AZ = 6°,7370 D = 280,70

PUNTO B: AZ = 11°,8329 D = 412,77

ANNOTAZIONI

Le coordinate del punto B sono le seguenti:

EST = 2.427.620,80 LONG. = 13°52'01",810

NORD = 4.758.603,16 LAT. = 42°58'25",343

Q = 106

A P P E N D I X 2

Gravity cores description

OCEANSCIENCE

CLIENTE/CLIENT	AGIP S.p.A.
AREA/AREA	PENNINA 8X
DATA/DATE	FEBBRAIO/FEBRUARY 1992
CAMPIONE N°/CORE N°	K 1
COORDINATE/CO-ORDS	E 2451538.58
	N 4763430.23
PROFONDITA'/WATER DEPTH	76.3 m
PENETRAZIONE/PENETRATION	3.3 m
FRAZIONE RECUPERATA/SAMPLE RECOVERED	2.2 m

DESCRIZIONE CAMPIONE/SOIL DESCRIPTION

Argilla grigio chiara fortemente plastica e coesiva

Light grey cohesive very plastic clay

OCEANOGRAFICA

CLIENTE/CLIENT	AGIP S.p.A.
AREA/AREA	PENNINA 8X
DATA/DATE	FEBBRAIO/FEBRUARY 1992
CAMPIONE N°/CORE N°	K 2
COORDINATE/CO-ORDS	E 2451469.96 N 4763372.43
PROFONDITA'/WATER DEPTH	76.2 m
PENETRAZIONE/PENETRATION	2.3 m
FRAZIONE RECUPERATA/SAMPLE RECOVERED	1.8 m

DESCRIZIONE CAMPIONE/SOIL DESCRIPTION

Argilla grigia chiara fortemente plastica e coesiva con rarissimi frammenti conchigliari

Light grey cohesive very plastic clay with rare shell fragments

OCEANSISMICA

CLIENTE/CLIENT	AGIP S.p.A.
AREA/AREA	PENNINA 8X
DATA/DATE	FEBBRAIO/FEBRUARY 1992
CAMPIONE N°/CORE N°	K 3
COORDINATE/CO-ORDS	E 2451469.96
	N 4763290.44
PROFONDITA'/WATER DEPTH	76.2 m
PENETRAZIONE/PENETRATION	3.3 m
FRAZIONE RECUPERATA/SAMPLE RECOVERED	1.7 m

DESCRIZIONE CAMPIONE/SOIL DESCRIPTION

Argilla grigio chiara fortemente plastica e coesiva con rarissimi frammenti conchigliari

Light grey cohesive very plastic clay with rare shell fragments

OCEANGIOMICA

CLIENTE/CLIENT	AGIP S.p.A.
AREA/AREA	PENNINA 8X
DATA/DATE	FEBBRAIO/FEBRUARY 1992
CAMPIONE N°/CORE N°	K 4
COORDINATE/CO-ORDS	E 2451548.60
	N 4763372.45
PROFONDITA'/WATER DEPTH	76.3 m
PENETRAZIONE/PENETRATION	3.3 m
FRAZIONE RECUPERATA/SAMPLE RECOVERED	2.0 m

DESCRIZIONE CAMPIONE/SOIL DESCRIPTION

Argilla grigio chiara fortemente plastica e coesiva

Light grey cohesive very plastic clay

OCEANSISMICA

s12:12H

A G I P

GEOR/DORT

PENNINA 8 X

RELAZIONE FINALE

ORTONA, FEBBRAIO 94

R E L A Z I O N E F I N A L E

INDICE GENERALE

FIGURE NEL TESTO

1- Carta indice
2- Calcoli SBHT
3- Interpretazione RFT
4- Rapporto carote di parete

ALLEGATI

1- PROFILO 1:1000
2- MASTER LOG
3- INTERPRETAZIONE DEL DIPMETER
4- STRATIGRAFIA

NOTE: -le profondita' sono in metri e riferite al p.t.r.
-le pressioni sono espresse in Kg/cm2
-le temperature sono espresse in gradi C.
-i tempi sono espressi in ore e minuti
-le densita' del fango sono espresse in gr/l
-i cloruri sono espressi in gr/l (Nacl)
-le inclinazioni del foro in gradi sessagesimali e le frazioni di grado in centesimi di grado

PARTE I --- DATI GENERALI ED UBICAZIONE

1.01 POZZO

Codice : 06265
Nome : PENNINA 8 X

1.02 PAESE

Codice : 101
Nome : ITALIA

1.03 MARE

ADRIATICO

1.04 PERMESSO / CONCESSIONE

B.C15.AV

1.05 TITOLARE DEL PERMESSO / CONCESSIONE

AGIP-SELM-SPI		(Titolare)
AGIP	71.000 %	(Operatore)
SELM	19.000 %	(Partner)
SPI	10.000 %	(Partner)

1.06 UBICAZIONE

Carta : NAUTICA
Foglio : 922
Linea Sismica :
S.P. :
Coordinate
Geogr. Long : E 014*09'34".1 Lat. : N 43*01'08".2 GREENWICH

1.07 QUOTE (riferite al livello del mare)

Fondo Marino : -76.0
Tavola Rotary : 29.0
Prima Flangia : 18.2

1.08 CLASSIFICAZIONE INIZIALE

NEW - POOL (PAY) WILDCAT

1.09 PROFONDITA' FINALE (da perforazione)

2736.0

1.10 ESITO MINERARIO

GAS

1.11 SITUAZIONE ATTUALE

TAPPATO E ABBANDONATO

PARTE II --- DATI GEOLOGICI

2.01 CAMPIONATURA IN FORMAZIONE

CUTTINGS

Nr.Fr.	Top	Bottom	Freq.Camp.	Tipo
1	410.0	2720.0	10.0	Lavati
1	2720.0	2730.0	5.0	Lavati
1	2730.0	2736.0	3.0	Lavati

CAROTE DI FONDO

Nessuna

CAROTE DI PARETE

Programmate	: 30
Fustelle vuote	: 1
Non sparate	: 0
Rimaste in pozzo	: 0
Recuperate	: 29

F.	R.	N.C.	Prof.	Status	Descrizione
1	1	1	2185.0	Recuperata	Argilla grigia molto siltosa
1	1	2	2154.0	Recuperata	Sabbia qtz fine biancastra deb. cemen.
1	1	3	2142.5	Recuperata	Sabbia qtz da medio-fine a fine
1	1	4	2115.0	Recuperata	Sabbia qtz fine biancastra
1	1	5	2107.0	Recuperata	Sabbia qtz fine biancastra
1	1	6	2095.0	Recuperata	Argilla grigio-verdastra mediam. dura
1	1	7	2084.0	Recuperata	Sabbia finissima qtz e Argilla c.s.
1	1	8	2060.0	Recuperata	Argilla grigio-verdastra mediam. dura
1	1	9	2043.0	Recuperata	Sabbia qtz da medio-fine a finissima
1	1	10	2035.5	Recuperata	Sabbia qtz da medio-fine a finissima
1	1	11	2027.1	Recuperata	Sabbia finissima qtz
1	1	12	2026.5	Recuperata	Silt grigio-verdastro
1	1	13	2025.0	Recuperata	Argilla molto siltosa
1	1	14	2024.5	Recuperata	Argilla siltosa grigia
1	1	15	1995.0	Recuperata	Sabbia qtz fine grigio-biancastra
1	1	16	1968.0	Recuperata	Argilla grigia mediamente dura
1	1	17	1959.8	Recuperata	Argilla grigia mediamente dura
1	1	18	1958.6	Recuperata	Argilla grigia mediamente dura
1	1	19	1958.0	Recuperata	Sabbia finiss. micacea passante a silt
1	1	20	1945.0	Recuperata	Sabbia qtz finissima grigio-biancastra
1	1	21	1932.7	Recuperata	Sabbia qtz finissima grigio-biancastra
1	1	22	1932.0	Recuperata	Sabbia finissima qtz / Argilla grigia
1	1	23	1931.3	Recuperata	Argilla siltoso-sabbiosa grigia

F.	R.	N.C.	Prof.	Status	Descrizione
1	1	24	1918.0	Fustella vuota	
1	1	25	1894.5	Recuperata	Sabbia finissima grigio-biancastra
1	1	26	1876.0	Recuperata	Argilla grigio scura med. dura
1	1	27	1865.0	Recuperata	Sabbia qtz da fine a finissima
1	1	28	1843.5	Recuperata	Sabbia qtz finissima deb. cementata
1	1	29	1797.0	Recuperata	Sabbia qtz fine cementata
1	1	30	1745.0	Recuperata	Argilla grigia med. dura

2.02 OPERAZIONI DI WELL LOGGING

Fr.	Nr.	D.	Codice	Run	Top	Bottom	Data	Contrattista
1	1	1	GR	1	406.0	1170.0	18/07/92	Schlumberger
1	1	1	LDL	1	406.0	1176.0	18/07/92	Schlumberger
1	1	1	PI	1	406.0	1194.2	18/07/92	Schlumberger
1	1	1	SLS	1	406.0	1183.0	18/07/92	Schlumberger
1	1	1	SP	1	406.0	1192.0	18/07/92	Schlumberger
1	1	2	GR	2	406.0	1183.0	19/07/92	Schlumberger
1	1	2	SHDT	1	406.0	1189.3	19/07/92	Schlumberger
1	2	1	GR	3	1197.5	2212.0	27/07/92	Schlumberger
1	2	1	PI	2	1197.5	2228.0	27/07/92	Schlumberger
1	2	1	SLS	2	1197.5	2217.0	27/07/92	Schlumberger
1	2	1	SP	2	1197.5	2227.0	27/07/92	Schlumberger
1	2	2	CNL	1	1600.0	2227.0	28/07/92	Schlumberger
1	2	2	EPT	1	1600.0	2217.0	28/07/92	Schlumberger
1	2	2	GR	4	1197.5	2213.0	28/07/92	Schlumberger
1	2	2	LDL	2	1197.5	2229.0	28/07/92	Schlumberger
1	2	3	GR	5	1197.5	2223.0	28/07/92	Schlumberger
1	2	3	SHDT	2	1197.5	2230.5	28/07/92	Schlumberger
1	2	4	GLT	1	1600.0	2228.0	28/07/92	Schlumberger
1	2	5	R.F.T.	1	1661.0	2221.5	29/07/92	Schlumberger
1	2	6	CST	1	1745.0	2185.0	30/07/92	Schlumberger
1	3	1	GR	6	2216.0	2720.5	07/08/92	Schlumberger
1	3	1	PI	3	2216.0	2738.0	07/08/92	Schlumberger
1	3	1	SLS	3	2216.0	2727.0	07/08/92	Schlumberger
1	3	1	SP	3	2216.0	2737.0	07/08/92	Schlumberger
1	3	2	CNL	2	2216.0	2735.0	08/08/92	Schlumberger
1	3	2	EPT	2	2216.0	2726.0	08/08/92	Schlumberger
1	3	2	GR	7	2216.0	2719.0	08/08/92	Schlumberger
1	3	2	LDL	3	2216.0	2739.0	08/08/92	Schlumberger
1	3	3	GR	8	2216.0	2732.0	08/08/92	Schlumberger
1	3	3	SHDT	3	2216.0	2737.0	08/08/92	Schlumberger
1	3	4	VSP	1	860.0	2735.0	08/08/92	Schlumberger

2.03 TEMPERATURE DAI LOGS

F.	N.	D.	Pr.Mis.	Prof.V.	T.Mis.	t.	Dt.	T.Calc.
1	1	1	1165.4	1165.4	39.4	2.00	10.00	39.4
1	1	2	1178.2	1178.2	39.4	2.00	14.30	39.4
1	2	1	2203.0	2203.0	55.3	2.00	7.00	56.0
1	2	2	2206.0	2206.0	55.3	2.00	12.00	56.0
1	2	3	2220.0	2220.0	55.6	2.00	19.50	56.0
1	3	1	2718.0	2718.0	68.0	1.50	6.00	70.0
1	3	3	2729.0	2729.0	69.0	1.50	17.00	70.0

2.04 FORMAZIONI - ETA'

INTERVALLO	-1- FORMAZIONE	-2- ETA'
410.0		
	-1-ARGILLE DEL SANTERNO	
	-2-PLEISTOCENE	
1165.0		
	-1-CARASSAI	
	-2-PLEISTOCENE	
1250.0		
	-1-CARASSAI	
	-2-PLIOCENE	SUPERIORE
2170.0		
	-1-CARASSAI	
	-2-PLIOCENE	MEDIO
2430.0		
	-1-ARGILLE DEL SANTERNO	
	-2-PLIOCENE	MEDIO
2500.0		
	-1-ARGILLE DEL SANTERNO	
	-2-PLIOCENE	INFERIORE
2730.0		
	-1-COLOMBACCI	
	-2-MESSINIANO	
2736.0		

2.05 DESCRIZIONE LITOLOGICA DELLE FORMAZIONI

Intervallo : 403.0 - 1165.0
Formazione : ARGILLE DEL SANTERNO
Descrizione :
Argilla grigio-chiara, siltosa, plastica, con rari livelli di sabbia fine.

Intervallo : 1165.0 - 2170.0
Formazione : CARASSAI
Descrizione :
Banchi di sabbia a grana da media a molto fine con intercalazioni di argilla grigio-chiara, plastica.

Intervallo : 2170.0 - 2730.0
Formazione : ARGILLE DEL SANTERNO-CARASSAI
Descrizione :
Argilla siltosa fossilifera da tenera a mediamente dura con rari livelli di sabbia quarzosa.Banco di sabbia a grana media da m 2350 a m 2363.

Intervallo : 2730.0 - 2736.0
Formazione : COLOMBACCI
Descrizione :
Calcare argilloso, marna e gesso.

2.06 RISULTATI GEOLOGICI

Il campo di Pennina, ubicato nell'offshore adriatico, zona B, circa 18 Km a NE di S. Benedetto del Tronto, e' situato in corrispondenza di un'anticlinale che interessa in maniera differente sia la serie mesozoica che quella pliocenica.La struttura e' leggermente allungata, con asse maggiore NW - SE e ricade all'interno del Bacino di Pescara, nel margine settentrionale,in corrispondenza della soglia di ingresso degli apporti torbiditici provenienti da Nord.
Il giacimento e' costituito da corpi sabbiosi pliocenici separati fra loro da fitte alternanze di argille, silt e sabbie fini.

PARTE III --- DATI MINERARI

3.01 MANIFESTAZIONI

- Foro : 1
  Intervallo : 2026.0 - 2026.0
  Operazione in corso : PERFORAZIONE
  Descrizione :
  L'unica manifestazione gassosa segnalata al cromatografo Geolog e' quella rilevata a m 2026 (0.4%) in corrispondenza del top del livello PEN 5.

3.02 MINERALIZZAZIONI

Intervallo	-1- Mineralizzazione -2- Formazione
470.0 - 501.0	-1- ACQUA SALATA -2-ARGILLE DEL SANTERNO
557.0 - 568.0	-1- ACQUA SALATA -2-ARGILLE DEL SANTERNO
580.0 - 593.0	-1- ACQUA SALATA -2-ARGILLE DEL SANTERNO
1250.0 - 1298.0	-1- ACQUA SALATA -2-CARASSAI
1322.0 - 1358.0	-1- TRACCE D'ACQUA SALATA -2-CARASSAI
1363.0 - 1389.0	-1- ACQUA SALATA -2-CARASSAI
1429.0 - 1487.0	-1- ACQUA SALATA -2-CARASSAI
1515.0 - 1537.0	-1- ACQUA SALATA -2-CARASSAI
1545.0 - 1576.0	-1- ACQUA SALATA

Intervallo	-1- Mineralizzazione -2- Formazione
	-2-CARASSAI -Zona PEN -Livello 17P
1579.0 - 1592.0	-1- ACQUA SALATA -2-CARASSAI
1597.0 - 1621.0	-1- ACQUA SALATA -2-CARASSAI -Zona PEN -Livello 16P
1631.0 - 1633.0	-1- GAS -2-CARASSAI -Zona PEN -Livello 15P
1633.0 - 1654.0	-1- ACQUA SALATA -2-CARASSAI -Zona PEN -Livello 15P
1660.0 - 1663.0	-1- GAS -2-CARASSAI -Zona PEN -Livello 14P
1668.5 - 1682.0	-1- ACQUA SALATA -2-CARASSAI -Zona PEN -Livello 14
1707.5 - 1711.0	-1- TRACCE DI GAS -2-CARASSAI -Zona PEN -Livello 13P
1784.5 - 1790.5	-1- GAS -2-CARASSAI -Zona PEN -Livello 12P
1790.5 - 1806.5	-1- ACQUA SALATA -2-CARASSAI -Zona PEN -Livello 12P
1811.0 - 1813.5	-1- GAS -2-CARASSAI -Zona PEN -Livello 11P

1815.0 - 1834.5 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 11P

1842.5 - 1846.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 10P

1846.5 - 1869.0 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 10P

1893.5 - 1896.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 9 P

1896.5 - 1900.5 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 9 P

1903.5 - 1905.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 9BP

1912.5 - 1917.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 8 P

1917.5 - 1960.5 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 8 P

1981.0 - 1992.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 7 P

1992.5 - 2008.0 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 7 P

2014.0 - 2017.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 6 P

2026.5 - 2030.0 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 5 P

2030.0 - 2050.0 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 5 P

2067.0 - 2079.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 4 P

2079.5 - 2086.5 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 4 P

2101.5 - 2116.0 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 3 P

2116.0 - 2120.0 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 3 P

2134.0 - 2143.0 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 2 P

2143.0 - 2170.0 -1- ACQUA SALATA
-2-CARASSAI
-Zona PEN -Livello 2 P

2191.5 - 2194.0 -1- TRACCE DI GAS
-2-CARASSAI
-Zona PEN -Livello 1BP

2199.0 - 2209.5 -1- GAS
-2-CARASSAI
-Zona PEN -Livello 1 P

2349.5 - 2363.0 -1- ACQUA SALATA
-2-CARASSAI

3.03 STIMOLAZIONI

Nessuna

3.04 PROVE DI STRATO

Nessuna

3.05 PROVE DI PRODUZIONE

Nessuna

3.06 BOLLETTINI ANALISI FLUIDI

Nessuno

3.07 WIRELINE FORMATION TESTS

- Foro nr. : 1
  R.F.T. n. : 1
  Data : 29/07/92
  Intervallo : 1632.0 - 2221.5
  Scopo : RILEVAMENTO PRESS.

Rilevamenti effettuati

Stazione n.	Profondita'	Minuti Risalita	Pressioni Kg/cmq - stabilizzata
1	1661.0	0	101.7 - no
2	1632.7	0	172.2 - si
3	1786.0	0	162.4 - si
4	1661.0	0	93.7 - no
5	1710.7	0	146.6 - si
6	1785.8	0	162.4 - si
7	1812.0	0	152.5 - si
8	1843.5	0	195.9 - si
9	1894.5	0	187.7 - si
10	1899.0	0	188.2 - si
11	1904.5	0	168.6 - si
12	1905.0	0	172.3 - si
13	1912.8	0	202.7 - si
14	1917.0	0	203.2 - si
15	1973.3	0	212.2 - si
16	1982.5	0	160.5 - si
17	1986.5	0	179.8 - si

Stazione n.	Profondita'	Minuti Risalita	Pressioni Kg/cmq - stabilizzata
18	1994.0	0	203.4 - si
19	1983.3	0	160.5 - si
20	1986.5	0	178.8 - si
21	2103.0	0	198.9 - si
22	2108.0	0	198.9 - si
23	2138.8	0	195.4 - si
24	2191.6	0	201.1 - no
25	2202.5	0	148.2 - si
26	2221.3	0	243.5 - si
27	2221.4	0	243.3 - si

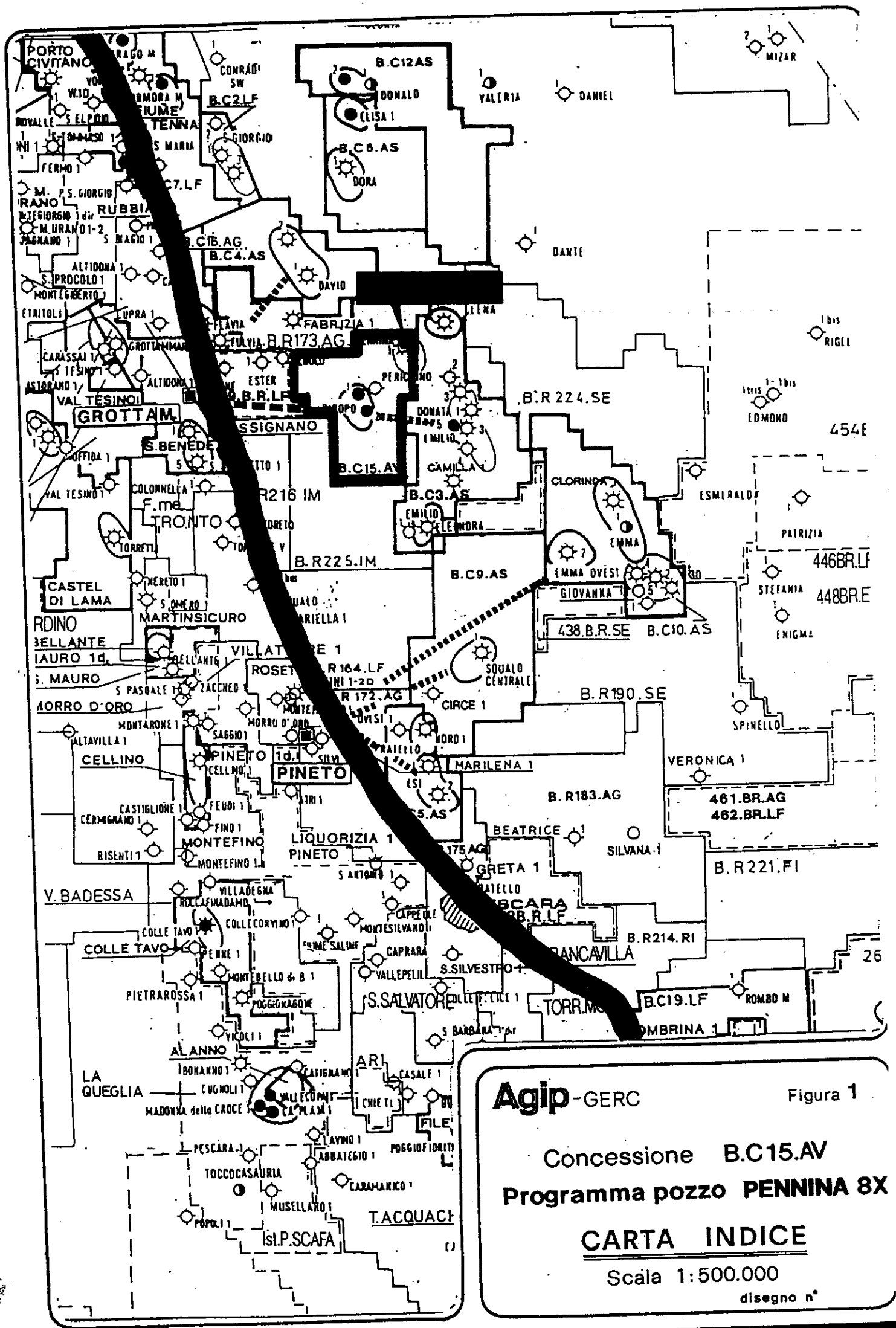
Campionamento

Nessuno

3.08 RISULTATI MINERARI

0.00 - 2736.00

La perforazione del pozzo Pennina 8x faceva parte del progetto esplorativo "strati sottili" del Bacino di Pescara.
Gli obiettivi minerari del sondaggio erano le fitte alternanze di argille siltose, silt e sabbie fini (di spessore inferiore al centimetro) costituenti la frazione distale di torbiditi.
In particolare erano stati presi in considerazione gli intervalli da m 1682 a m 1784.5 (ossia dal bottom del livello PEN 14 al top del livello PEN 12) e da m 2209.5 a circa m 2400 (dal bottom del PEN 1 al fondo pozzo del pozzo Pennina 1).
Dall'analisi dei log elettrici il pozzo, sebbene mineralizzato nei livelli gia' noti e produttivi del campo, non e' risultato interessante negli intervalli obiettivi e pertanto e' stato chiuso minerariamente tramite esecuzione di quattro tappi di cemento.



Agip -GERC

Figura 1

Concessione B.C15.AV

Programma pozzo PENNINA 8X

CARTA INDICE

Scala 1:500.000

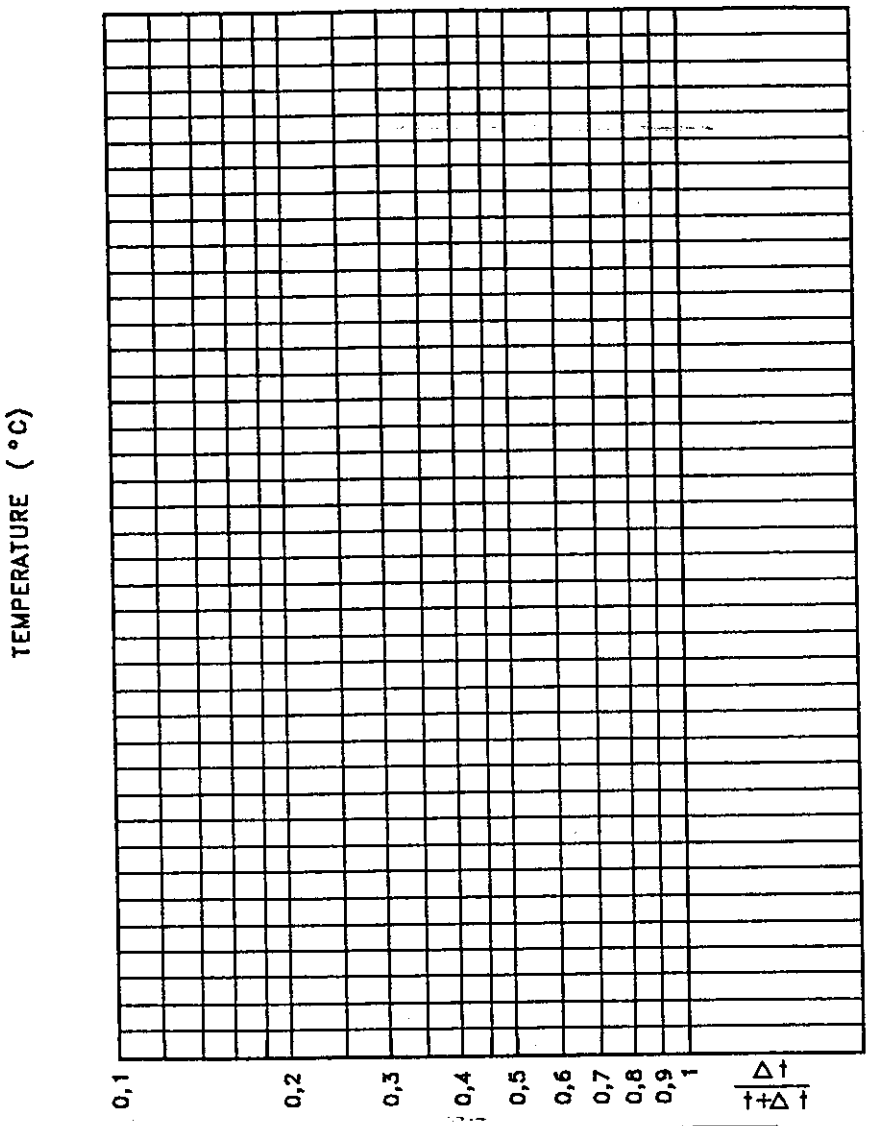
disegno n°

AGIP S.p.A.
GEOLS–SECE

Pozzo: PENNINA 8 X

CALCOLO BHT

OPERAZIONE n 1 DATA 19–07–92
PROFONDITA' MAX RAGGIUNTA m 1196
TEMPERATURA REGISTRATA AL FONDO 39,4 *C



PUNTO	t (hr)	Δt (hr)	Δt / t+Δt	TEMP °C	LOG
A	2	10,0	0,83	39,4	PI–SLS–LDL
B	2	14,5	0,88	39,4	SHDT–GR

t = tempo di durata dell'ultima circolazione
Δt = tempo trascorso fra l'arresto della circolazione e la misura della temperatura

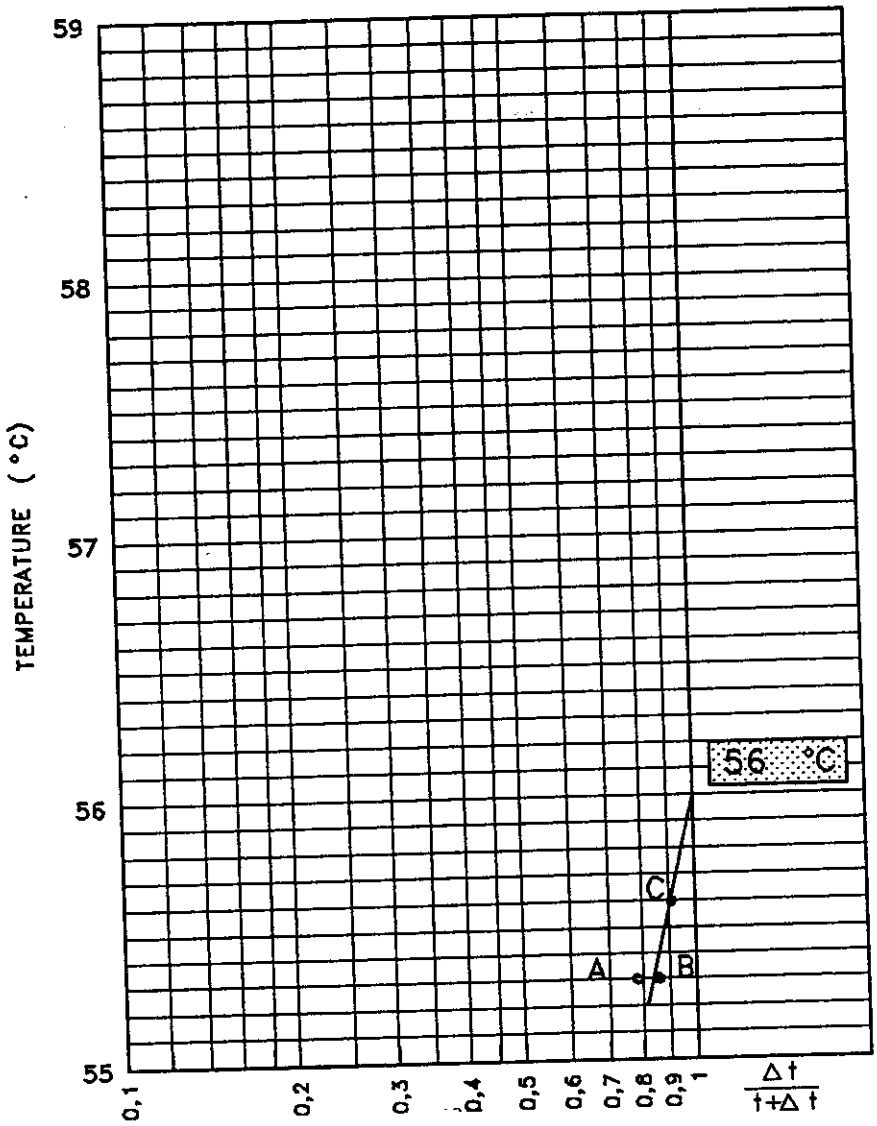
Note:

AGIP S.p.A.
GEOLS–SECE

Pozzo: PENNINA 8 X

CALCOLO BHT

OPERAZIONE n 2 DATA 28–07–92
PROFONDITA' MAX RAGGIUNTA m 2231
TEMPERATURA STATICA RICAVATA 56 *C



PUNTO	t (hr)	Δt (hr)	Δt / t+Δt	TEMP °C	LOG
A	2	7.0	0.78	55.3	PI–SLS
B	2	12.0	0.86	55.3	LDL–CNL
C	2	19.5	0.91	55.6	SHDT
D					
E					

t = tempo di durata dell'ultima circolazione
Δt = tempo trascorso fra l'arresto della circolazione e la misura della temperatura

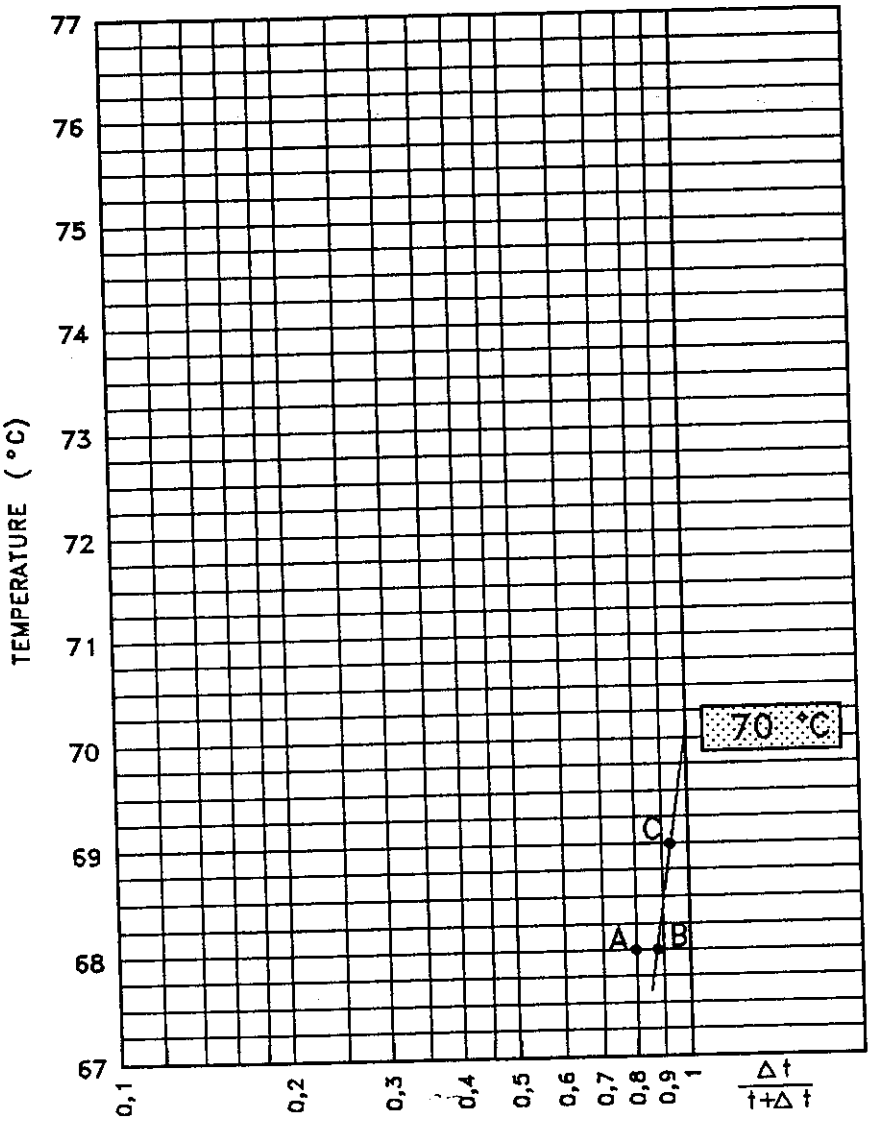
Note: TEMPERATURE DA AMS

AGIP S.p.A.
GEOLS–SECE

Pozzo: PENNINA 8 X

CALCOLO BHT

OPERAZIONE n 3 DATA 08–08–92
PROFONDITA' MAX RAGGIUNTA m 2736
TEMPERATURA STATICA RICAVATA 70 *C



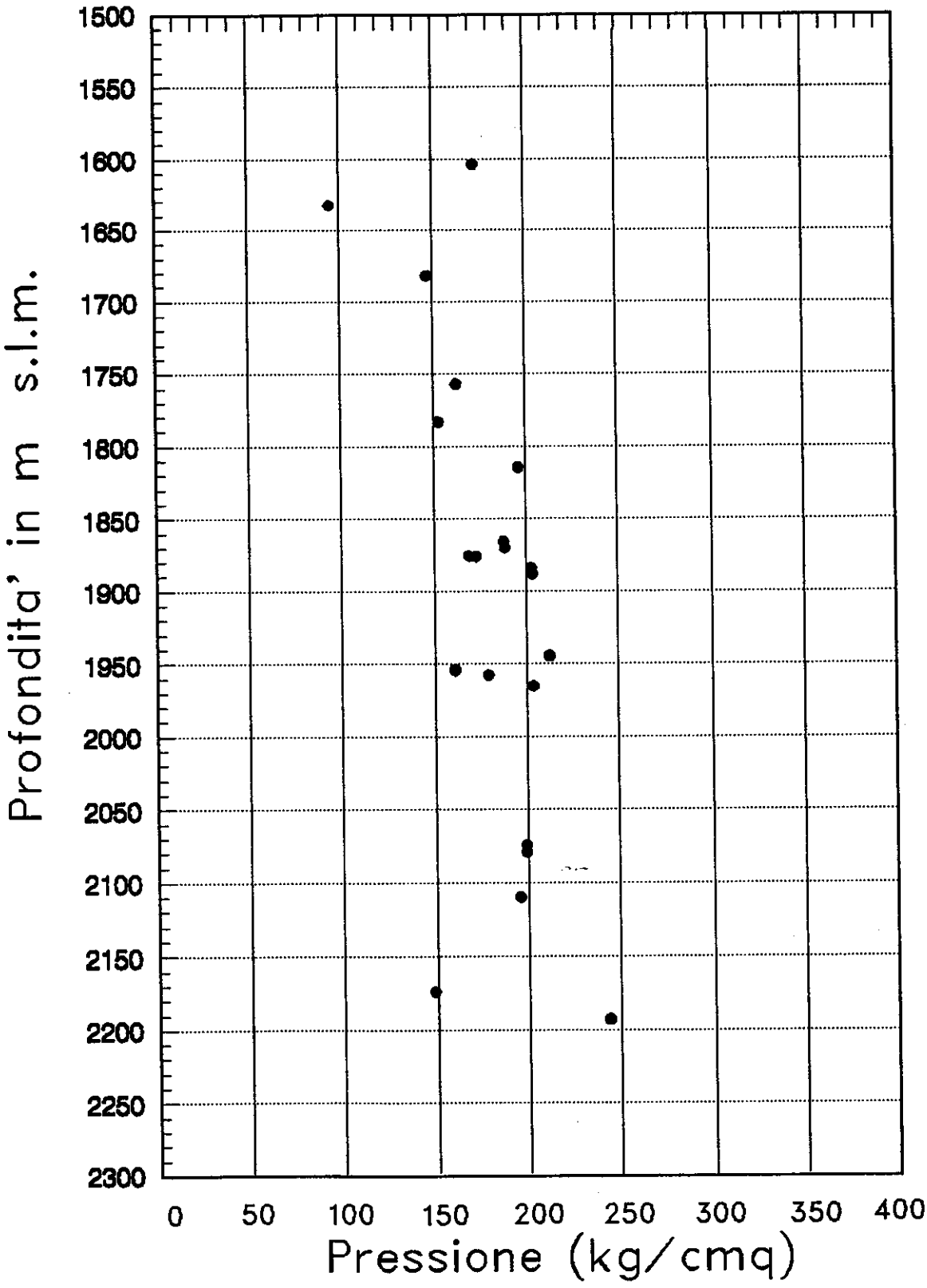
PUNTO	t (hr)	Δt (hr)	Δt / t+Δt	TEMP °C	LOG
A	1.5	6	0.80	68	PI–SLS–GR
B	1.5	11	0.88	68	LDL–CNL–EPT
C	1.5	17	0.92	69	SHDT–GR

t = tempo di durata dell'ultima circolazione
Δt = tempo trascorso fra l'arresto della circolazione e la misura della temperatura

Note: Temperatura da AMS

PENNINA 8 X

MISURE DI PRESSIONE DA RFT



AGIP
GEOLS–SECE

RAPPORTO CAROTE DI PARETE

POZZO PENNINA 8 X

Data di prelievo 30/07/92
Discesa n. 1
Carotiere CST–C
Fango FW–LS D=1230 g/l

Quota Tavola Rotary 29 m
Scarpa ultimo CSG 13 3/8"
Carote Programmate n.30
Carote Prelevate n. 30
Carote recuperate n. 29

Profondita 2228 m
a m 1196 Foro 12 1/4"
Fustelle non partite n. 0
Fustelle vuote n. 1
Fustelle In pozzo n. 0

N°	PROFONDITA'	DESCRIZIONE LITOLOGICA E OSSERVAZIONI	MANIFESTAZIONI
1	2185	Argilla grigia molto siltosa	odore idrocarburi
2	2154	Sabbia Qtz fine biancastra deb.cementata	leggero odore Idr.
3	2142.5	Sabbia Qtz medio–fine a fine	odore idrocarburi
4	2115	Sabbia Qtz fine biancastra	leggero odore Idr.
5	2107	Sabbia c.s.	
6	2095	Argilla grigio verdastra med. dura	
7	2084	Sabbia Qtz finissima e Argilla c.s.	
8	2060	Argilla grigio verde med. dura	
9	2043	Sabbia Qtz da med. fine a finissima	odore idrocarburi
10	2035.5	Sabbia c.s.	leggero odore Idr.
11	2027.1	Sabbia Qtz finissima	
12	2026.5	Silt grigio verde	
13	2025	Argilla molto siltosa	odore idrocarburi
14	2024.5	Argilla siltosa grigia	
15	1995	Sabbia Qtz grigio biancastra fine	
16	1968	Argilla grigia med. dura	
17	1959.8	Argilla c.s.	
18	1958.6	Argilla c.s.	
19	1958	Sabbia Qtz finissima passante a Silt. Abb. mica	
20	1945	Sabbia Qtz grigio biancastra finissima	
21	1932.7	Sabbia c.s.	odore idrocarburi
22	1932	Sabbia c.s. e Argilla grigia	leggero odore Idr.
23	1931.3	Argilla siltoso–sabbiosa grigia	leggero odore Idr.
24	1918	Vuota	
25	1894.5	Sabbia Qtz grigio biancastra finissima	
26	1876	Argilla grigio scuro med. dura	
27	1865	Sabbia Qtz da fine a finissima	
28	1843.5	Sabbia Qtz finissima deb. cementata	
29	1797	Sabbia Qtz fine cementata	
30	1745	Argilla grigia med. dura	

COMPILATO DA
M. PARISSENTI

CONTROLLATO DA
I. DEGIOVANNI

OPERATORE
M. VELOSO/I. SHEARD
SCHLUMBERGER