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PARCO EOLICO OFFSHORE AL LARGO DELLE COSTE DI CIVITAVECCHIA

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Progetto

Dott. Ing. Luigi Severini

Ord. Ing. Prov. TA n.776

Elaborazioni

iLStudio.

Engineering & Consulting Studio

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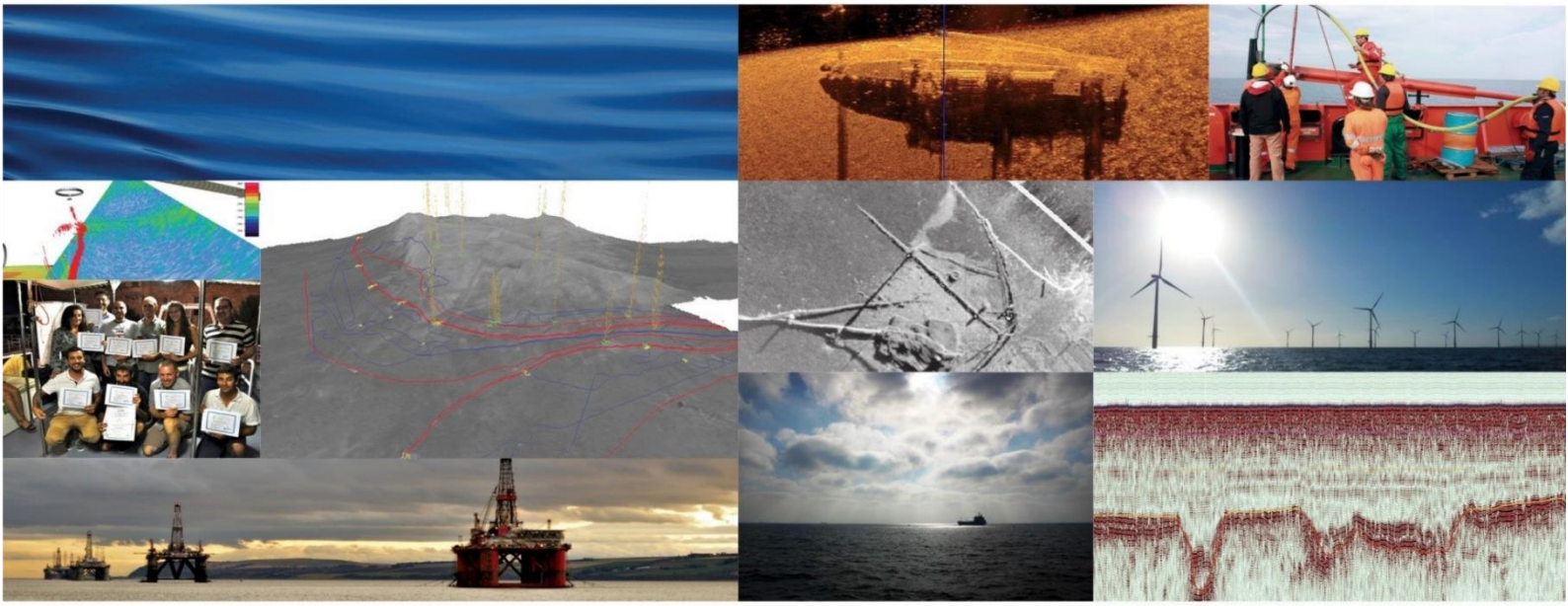
www.gbtoffshore.com
info@gbtoffshore.com



Operational Report

Tyrrhenian Wind Energy | Floating Offshore Windfarm

P22040 | 29 March 2023

For Client Review

TYRRHENIAN WIND ENERGY

TYRRHENIAN
WIND ENERGY

Geo & Bio Team Group

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Document Control

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Project Team

Initials	Name	Role
GDG	Giuseppe Di Grigoli	Project Manager
AN	Alessandro Nemola	Senior Surveyor / Party Chief
NC	Nicola Corrias	Senior Surveyor / Party Chief
DG	Daniele Gitto	Senior Survey Engineer
MP2	Marco Pantina	Surveyor
SP	Sonia Provenzale	Surveyor
MP	Massimiliano Puleio	Senior Geologist / Data Processor / Reporting
GC	Gaspare Ciaccio	Senior Geologist /Data Processor
RS	Renato Sorce	Data Processor / Senior Surveyor
AF	Andrea Felice	Geologist / Reporting
LM	Livio Munna	Surveyor

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Abbreviations & Acronyms

CoNISMa	Consorzio Nazionale Interuniversitario per le Scienze del Mare
CRP	Common Reference Point
DTM	Digital Terrain Model
FOS	Field Offshore Substation
GAMS	GNSS Azimuth Measurement Subsystem
GHP	Geophysical
GNSS	Global Navigation Satellite System
HD	High Definition
LAT	Lower Astronomical Tide
MAG	Magnetometer
MBES	Multi Beam Echo Sounder
MRU	Motion Reference Unit
QC	Quality Control
RMS	Root Mean Square
ROV	Remotely Operated Vehicle
SBP	Sub-bottom Profiler
SD	Standard Deviation
SPK	Sparker
SSS	Side Scan Sonar
SVP	Sound Velocity Profiler
TWE	Tyrrhenian Wind Energy
USBL	Ultra-short baseline acoustic positioning system
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator (Projection)
WD	Water Depth
WGS84	World Geodetic System 84

1. INTRODUCTION AND SCOPE OF WORK

1.1 PROJECT DESCRIPTION

Geo Bio Team Group s.r.l. has been asked by Tyrrhenian Wind Energy s.r.l., to perform nearshore and offshore survey to provide geophysical information on the nature of the terrain within a defined corridor and two possible offshore wind farm sectors.

The landing area for the cable route survey is located about 5 km north of Civitavecchia (Latium - Italy), in the proximity of "Torrevaldaliga Nord" thermoelectric power station.

An overview of the survey area is shown in the Figure 1.1:

Figure 1.1 - Project location.

1.2 SCOPE OF WORK

The survey consisted in the following activities:

- Vessel Mobilization / Demobilization
- Multibeam Bathymetry;
- Side Scan Sonar imagery;
- Detection of existing cables and services with magnetometer;
- Sub-bottom Profiling and Sparker to determine sediment thickness along the whole area;
- Video inspection and grab samplings.

GBT provided equipment, personnel, data acquisition/processing and operational report (this document). The survey has been performed onboard the Orca II vessel.

1.3 DOCUMENT SCOPE

This document contains information regarding project operations (on-field and processing works), equipment calibrations, and delivered data.

2. SURVEY AREA

The survey sector was divided in:

- Two offshore areas corresponding with the future wind farms, named Area A and Area B and 57 and 22 sq km wide, respectively;
- Two corridors (named Area C and Area D1), 950 m wide and centred on the future power cables that will join the wind farms and the marine substation (FOS) at about 190 m W.D.;
- One corridor (named Area D2), 350 m wide and centred on the future 220 kV power cable that will join the marine substation (FOS) and the nearshore sector;
- A nearshore area 800 m wide, from 10 to 40 m WD and centred on the future power cable that will join the previous 350 m wide corridor and the landing point (TJB).
- One alternative corridor to D2 (named corridor D4) for three 66 kV power cables, in the north zone of the survey area that will join the nearshore sector and the Area A.

An overview of survey sectors is shown in the Figures 2.1 and 2.2.

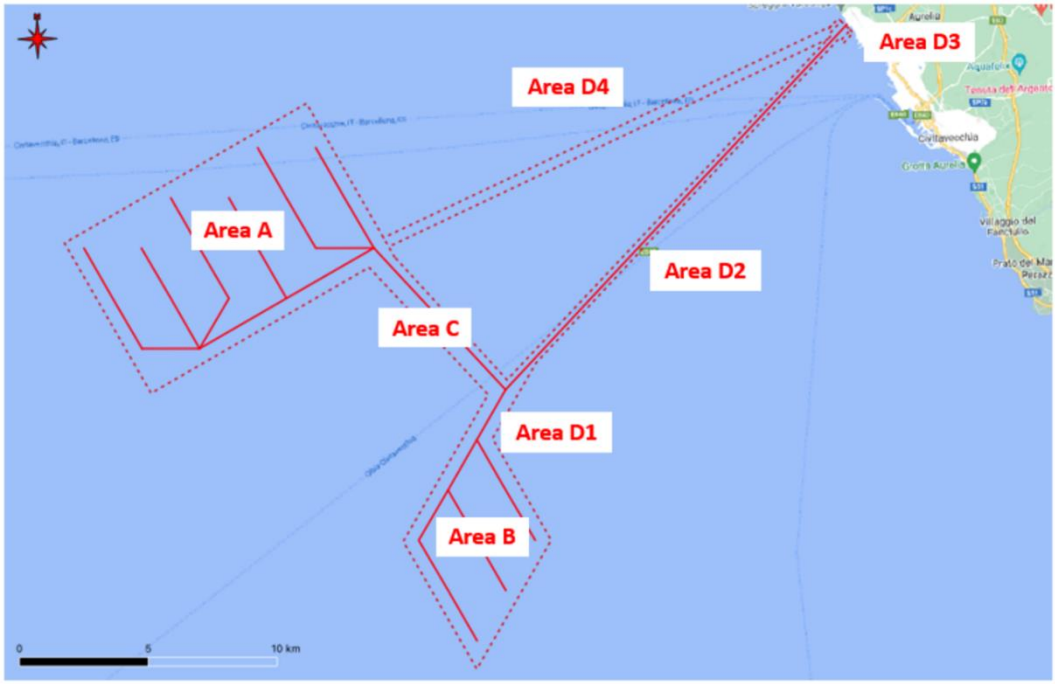


Figure 2.1: Survey Area – Overview.

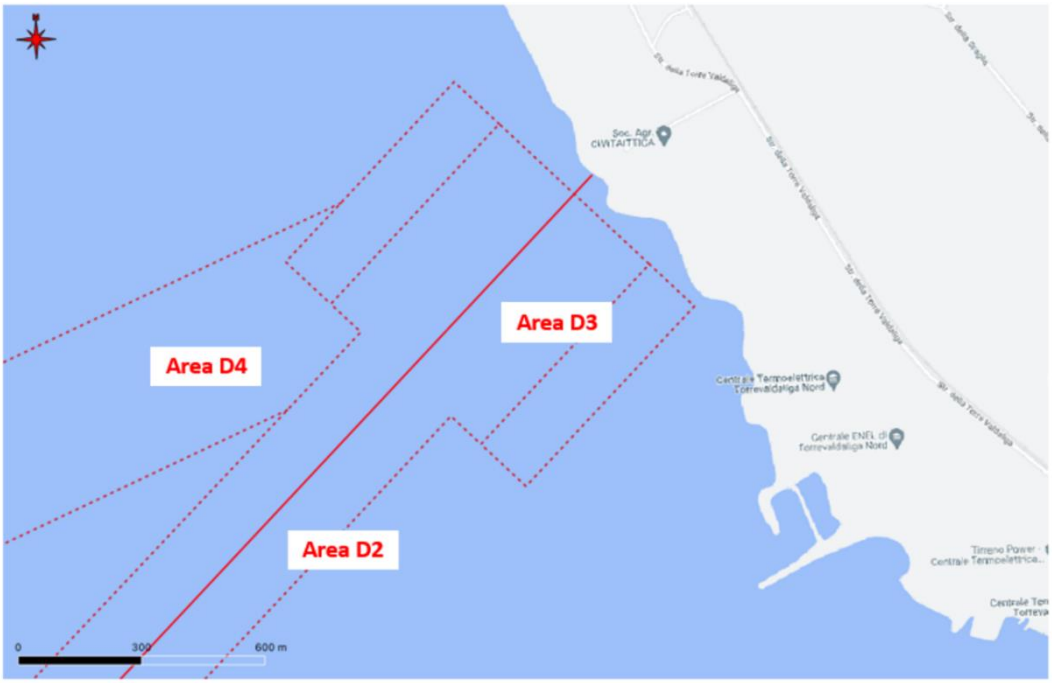


Figure 2.2: Survey Area – Nearshore Detail.

2.1 SURVEY DESIGN

The line plans were designed for A, B, and D3 areas to ensure a minimum of 25% overlap in SSS data, as requested by the Client. Additionally, a seismic survey (SBP and SPK) was planned, for the exception of nearshore sector (D3). Corridor C, D1, D2 and D4 will be surveyed by a single-centred line (Figure 2.3 and Figure 2.4). In detail:

- **Area A**: the proposed line plan consisted of 20 MBES, SSS and MAG lines, 350 m spaced, and 8 SBP and SPK lines, 1000 m spaced; this plan included 500 m extension in SW direction (out of the planned survey area), as requested by the Client;
- **Area B**: the proposed line plan consisted of 10 MBES, SSS and MAG lines, 525 m spaced, and 6 SBP and SPK lines, 1000 m spaced;
- **Area C**: the proposed line plan consisted of 1 MBES, SSS and MAG line and 1 SBP and SPK line, centred on the corridor;
- **Area D1**: the proposed line plan consisted of 1 MBES, SSS and MAG line and 1 SBP and SPK line, centred on the corridor;
- **Area D2**: the proposed line plan consisted of 1 MBES, SSS and MAG line centred on the corridor;
- **Area D3** (nearshore): the proposed line plan consisted of 13 MBES, SSS and MAG lines. No seismic survey has been required by the Client.
- **Area D4**: the proposed line plan consisted of 1 MBES, SSS and MAG line centred on the corridor.

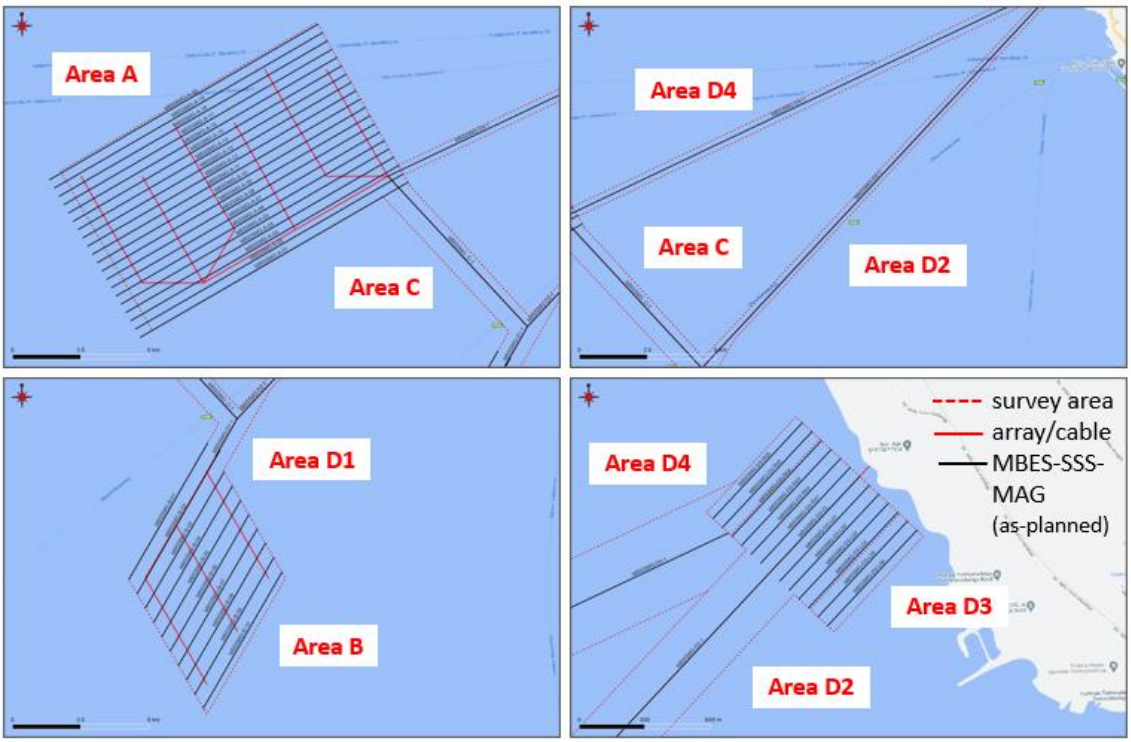


Figure 2.3: Survey Areas – MBES, SSS and MAG Line Plan.

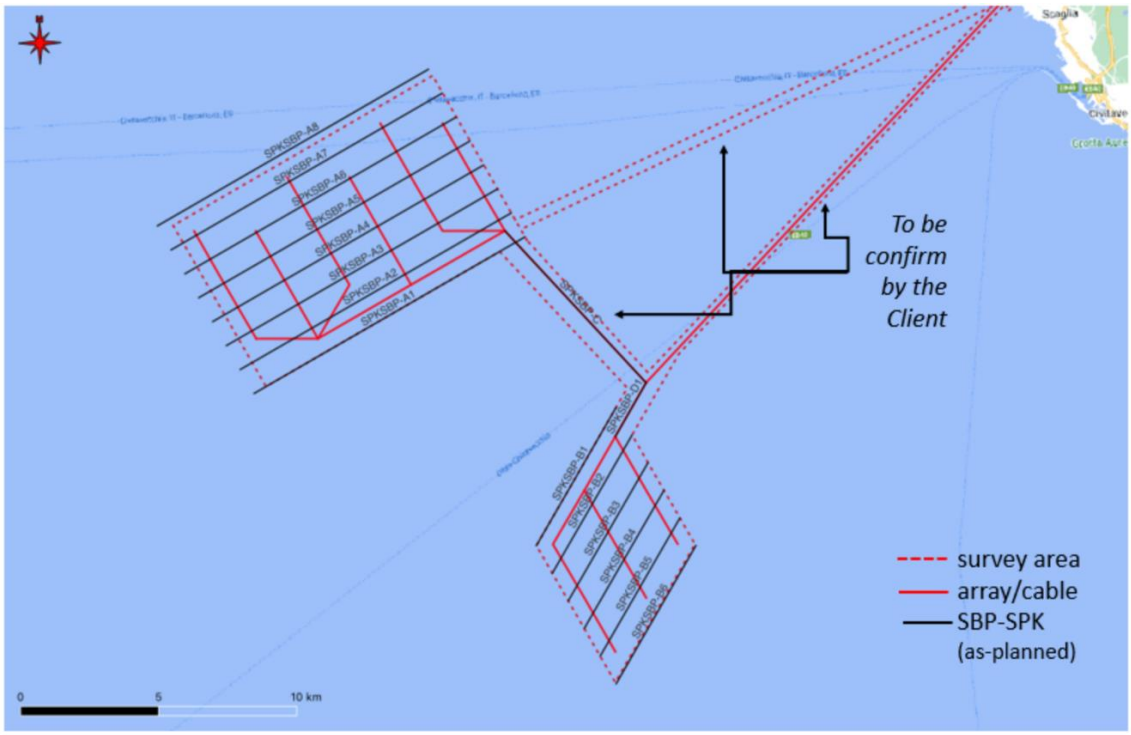


Figure 2.4: Survey Areas – SBP and SPK Line Plan.

Additionally, Client requested for 6 lines across and along 3 canyons located between A and B sectors (Figure 2.5).

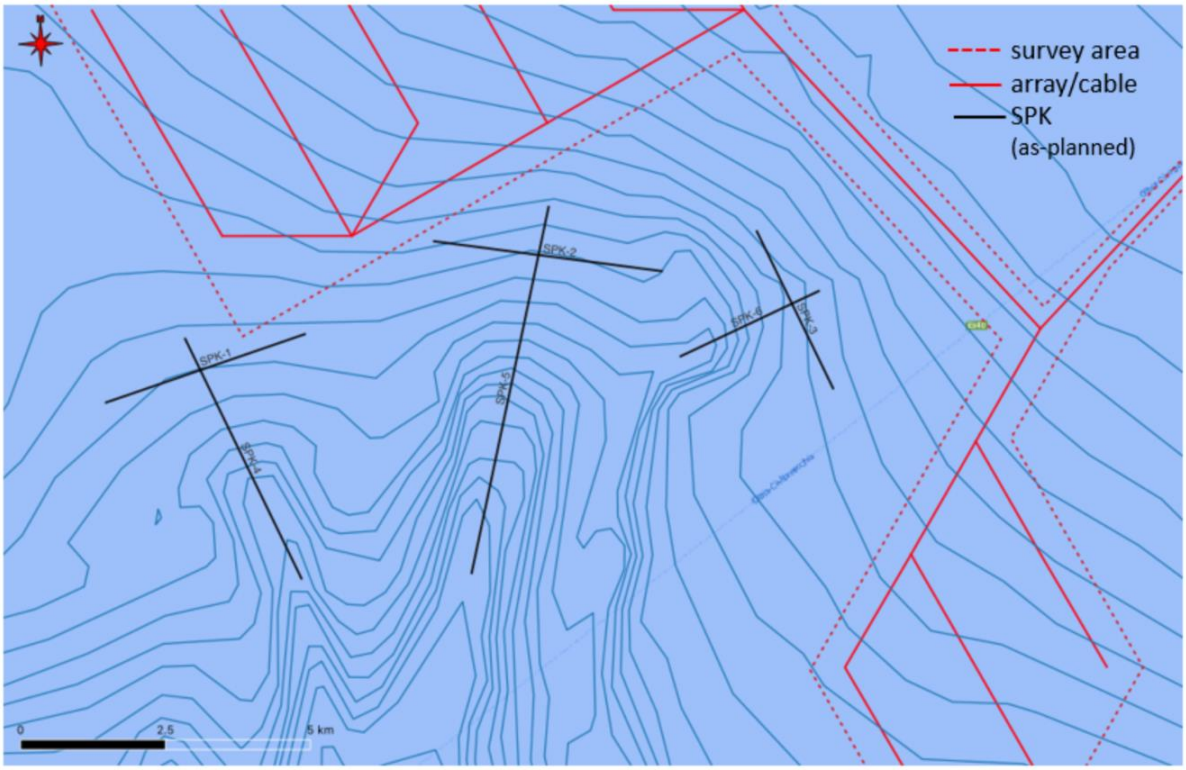


Figure 2.5: Survey Areas– SPK Line Plan along and across the canyons.

The survey activities have been divided into 3 steps:

- **Phase I** - multibeam echo sounder, side scan sonar, and magnetometer survey;
- **Phase II** - sub-bottom profiler and sparker survey;
- **Phase III** - visual inspection by ROV and grab samplings.

3. GEODETIC AND PROJECTION PARAMETERS

The Geodetic and Projection parameters are reported in the Table 3.1:

Table 3.1: Geodetic Parameters

PROJECT GEODESY	
Datum:	World Geodetic System 1984 (WGS84)
Ellipsoid:	World Geodetic System 1984 (WGS84)
Semi major axis:	a = 6 378 137.000 m
Reciprocal Flattening:	1/f = 298.257 223 563
Projection:	UTM zone 32
Latitude of Origin	0°
Central Meridian:	9°
False Easting:	500.000.00
Scale factor on Central Meridian:	0.9996
Units:	Meters

3.1 VERTICAL REFERENCES

The vertical reference for the survey and all deliverables will be Lowest Astronomical Tide (LAT).

4. SURVEY OPERATIONS

In the table and diagram below, a summary of survey operations is shown. It is possible to notice that the survey was strongly influenced by the stand-by weather (over 34% of the time); indeed, the survey area has been affected by constant marine currents and wind with frequent and sudden changes in direction that often limited the operations.

Table 4.1: Survey operations summary

ACTIVITY	DAYS	PERCENTAGE (%)
MOB	7	9,2%
Survey	27	35,5%
Extrawork GPH	4	5,3%
Extrawork ROV	1	1,3%
Extrawork Sampling	1	1,3%
Stand-by weather	26	34,2%
Downtime (vessel)	1	1,3%
Downtime (client)	4	5,3%
Transit	4	5,3%
Demob	1	1,3%
Total Days	**76**	**100,0%**

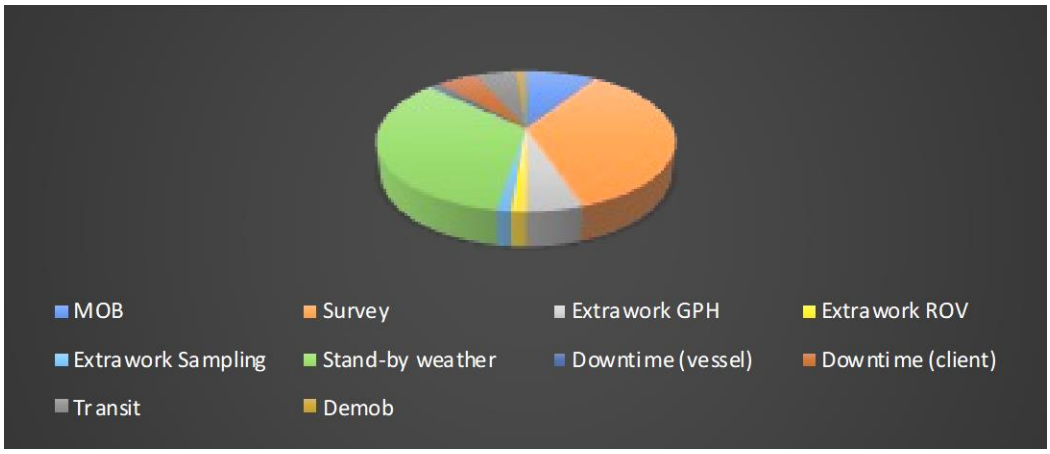


Figure 4.1: Survey operation summary.

Day by day survey log sheet is reported in **Appendix A**.

5. VESSEL, EQUIPMENT AND SETTINGS

5.1 SURVEY UNITS

Table 5.1: Survey Units

VALUE	UNIT
Time: Navigation, Multibeam, Side Scan Sonar; Sub Bottom Profiler, Magnetometer and ROV	Italy local time (UTC + 02:00 hours)
Linear units	Meters, according to the international system of units (m)
Angular units	Degrees, Minutes, Seconds (°, ', '')

5.2 VESSEL

Survey carried out by M/B ORCA II (Figure 5.1 and Table 5.2). Launched in 2006 by Naval Service srl (Naples), is a vessel suitable for environmental and geophysical research, for short and medium-term surveys. The onboard tender allows operating up to the shoreline, while the nautical and safety equipment ensures full operation in the open sea. Current owner is ORCA COMMERCIAL H&O SPILL srl. The vessel has been mobilised in Fiumicino Port, Rome (ITA) and it worked on 12 hours basis, daylight.

Figure 5.1: M/B Orca II.

Table 5.2: Civitavecchia Survey Vessel M/B Orca II Technical Specs.

NAME	M/B Orca II
FLAG	Italy
LENGTH OVERALL	17.88 m
WIDTH OVERALL	6.36 m
GROSS TONNAGE	9.67 t
ENGINE	2 x 176.5 KW
MAX PEOPLE ONBOARD	8

5.2.1 Vessel Offset

Table 5.3: Vessel Offset.

OFFSET	X [m]	Y [m]	Z [m]
CRP	0	0	0
Antenna 1	2.731	6.28	-3.136
Antenna 2	0.966	10.825	-2.433
USBL	3.205	5.69	2.9
MRU	3.21	6.61	2.613
MBES	3.21	6.16	2.782
Crane	0.18	-1.9	0

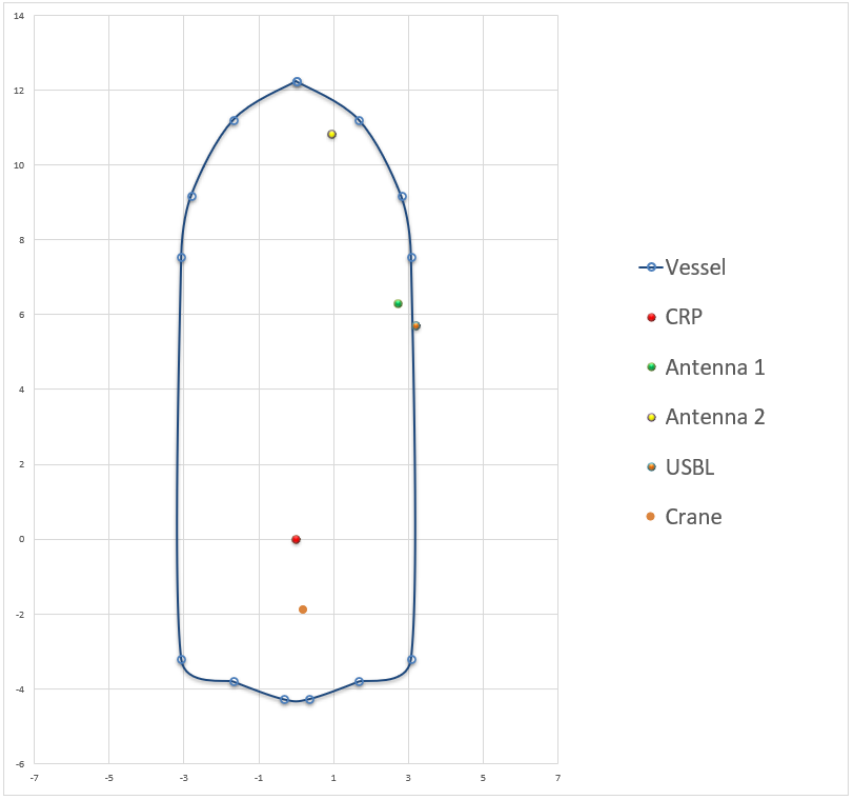


Figure 5.2: Vessel Offsets.

5.3 ACQUISITION SOFTWARE

Softwares used during data acquisition are listed in the table below.

Table 5.4: Acquisition software.

SOFTWARE	VERSION	NOTE
QINSy	9.4.3	All phases
SonarPro	12.0	SSS (phase I)
GeoSuite Acquisition	2022R1	SPK (phase II)
SesWin	V2213	SBP (phase II)

5.4 EQUIPMENT AND SETTINGS

The survey equipment list is reported in the table below.

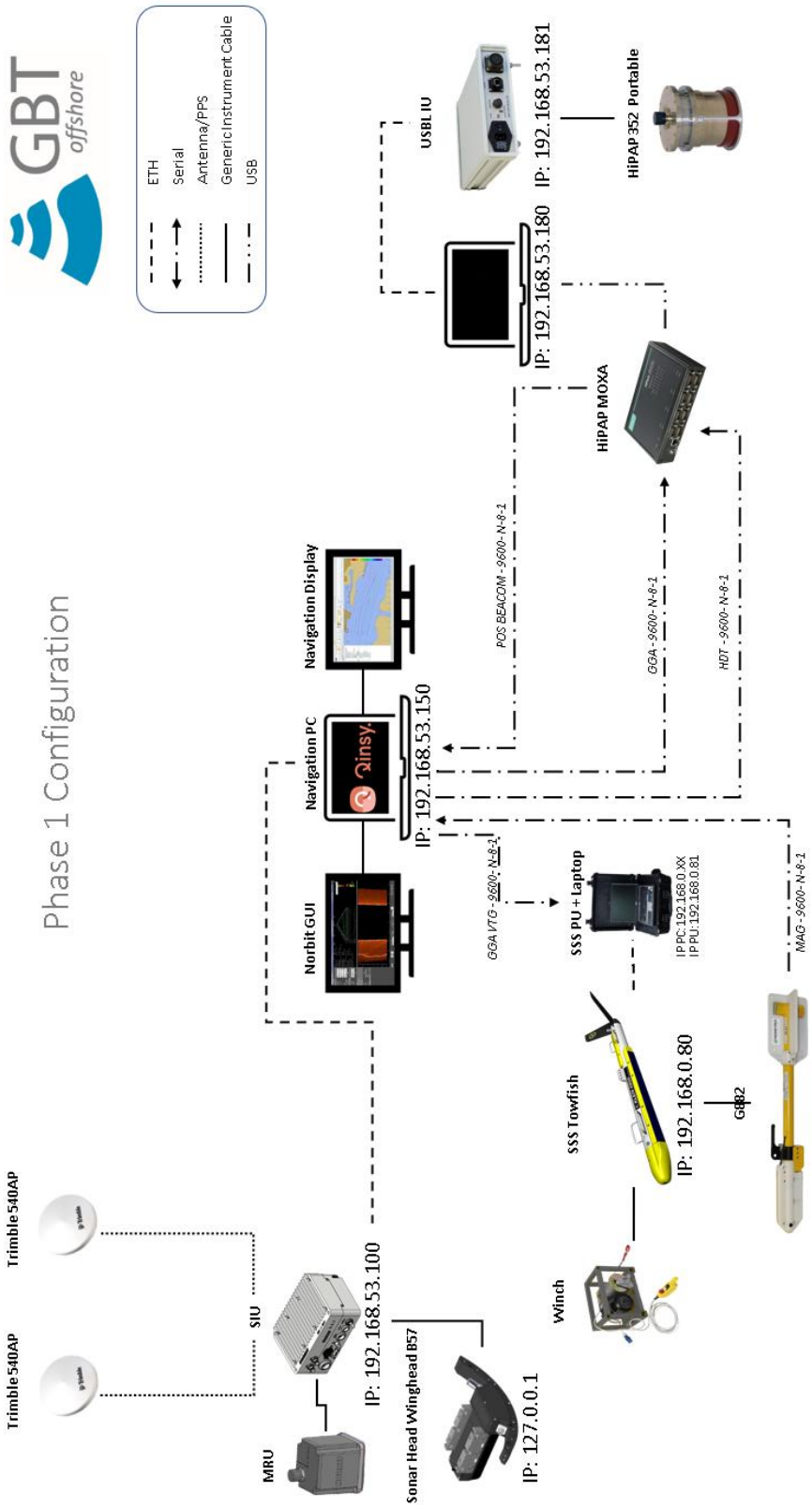
Table 5.5: Survey equipment on board.

ITEM	DESCRIPTION
Ultra-Short BaseLine	USBL µPAP HiPAP 352 Portable Kongsberg
Multibeam Echosounder	1 MB Norbit Winghead B57S R&D Version 100kHz
Side Scan Sonar	KLEIN 3000 (100-500 KHz)
Sub Bottom Profiler	Innomar SES-2000 Medium-100 (6-8 KHz)
Sparker	GeoSource 200LW (dominant frequencies: 1250-1750 Hz (@ 400 J)
Magnetometer	GEOMETRICS G882 Magnetometer
ROV	SAAB SEAEYE Falcon-DR (including SD and HD camera, GoPro)
SVP	Norbit AML

In the next paragraphs, the detailed vessel configuration sketches for each phase are reported. The equipment brochures are reported in **Appendix B**.

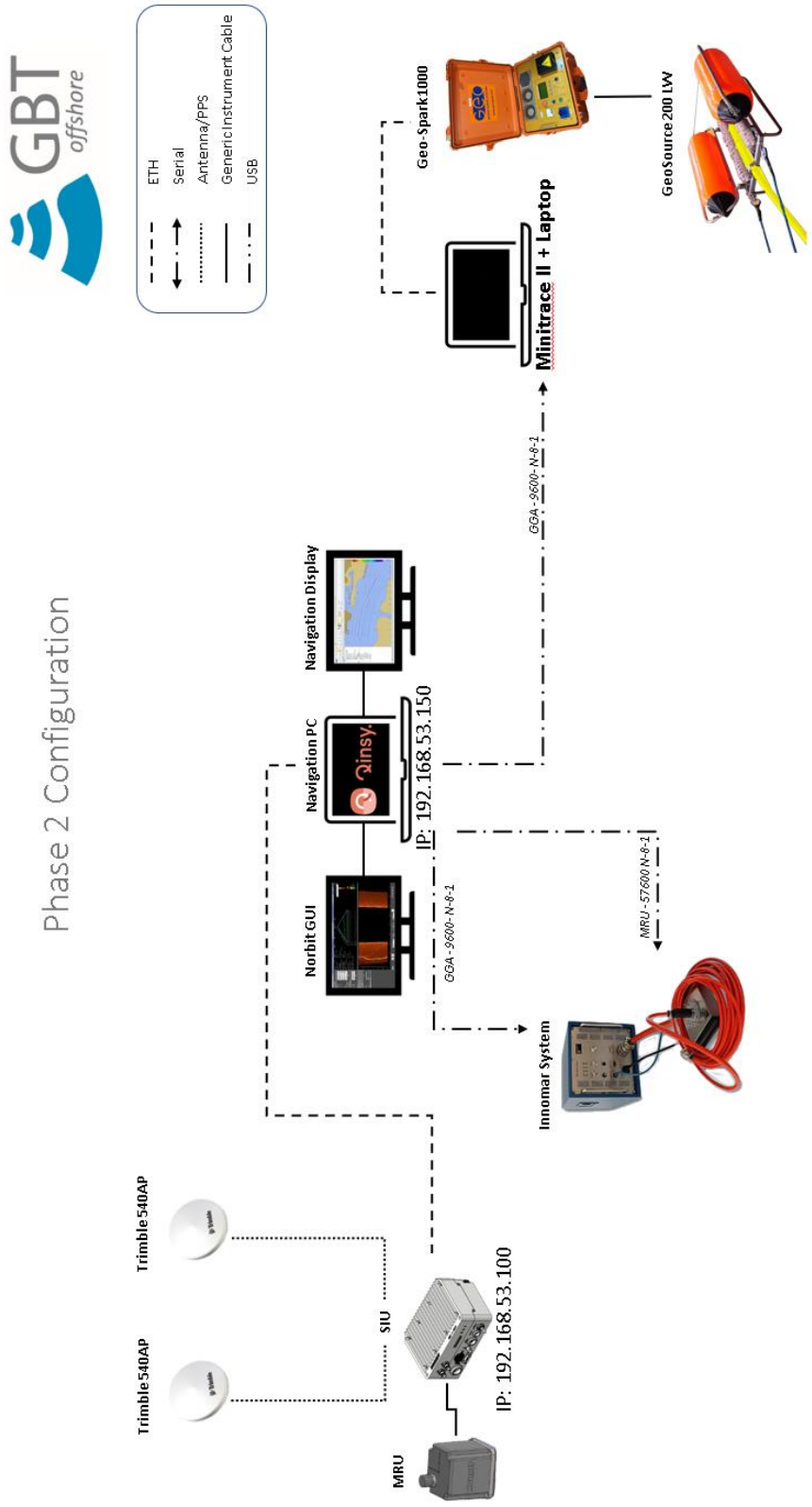
5.4.1 Vessel Configuration (Phase I)

Figure 5.3: Vessel configuration during Phase I.



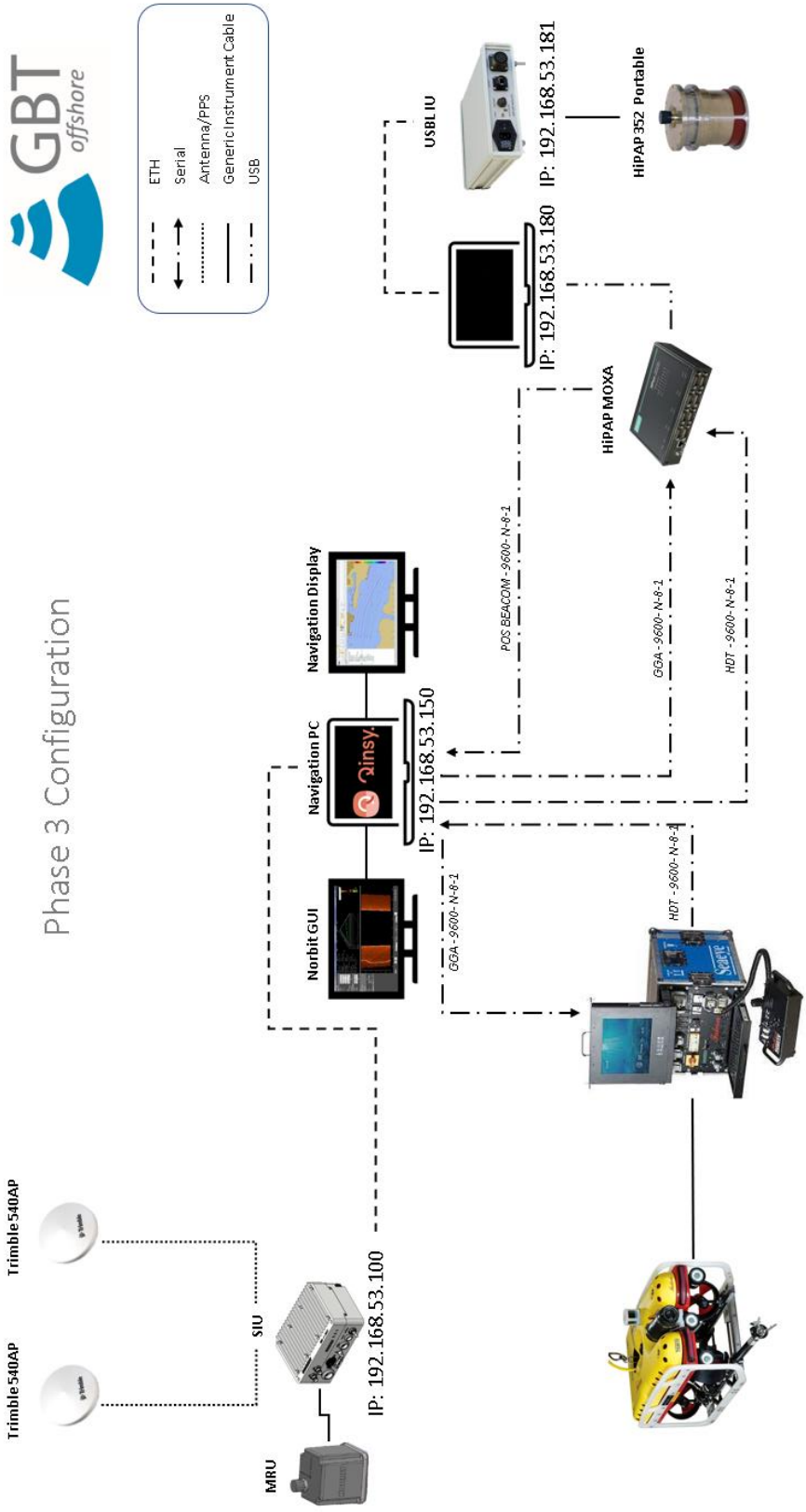
5.4.2 Vessel Configuration (Phase II)

Figure 5.4: Vessel configuration during Phase II.



5.4.3 Vessel Configuration (Phase III)

Figure 5.5: Vessel configuration during Phase III.



6. SURVEY

6.1 GEOPHYSICAL SURVEY

The geophysical survey has been performed in two (2) steps:

- **Phase I** has been performed by **multibeam echo sounder**, **side scan sonar**, and **magnetometer**. As requested by the Client, an extra work survey (by side scan sonar and magnetometer) has been performed to analyse an offshore target located in sector A.
- **Phase II** has been performed by the **sub-bottom profiler** and **sparker**. As requested by the Client, an extra work seismic survey (4 days) has been performed in the marine canyons sector (between A and B areas), and along the D2 and D4 corridors, in addition to the crossing lines in A and B zones.

6.1.1 Collected data

During **phase I** (between 2022, Nov. 14th and 2022, Dec. 14th and between 2023, Feb. 1st and 2023, Feb. 14th) about 385 km of multibeam echo sounder, side scan sonar, and magnetometer have been collected. At the end of this phase, an unknown target (about 10x20 m) was identified in the northern corner of area A and an extra inspection (about 1.625 km) has been planned.

Area A has been surveyed by 21 lines (figure 6.1): 5 lines NW-SE oriented that cover the deeper part of the sector and 16 lines NE-SW oriented that cover the shallow part of the zone. The distal NW-SE line runs out of the survey area limit (red line in Figure 6.1) because the Client requested 1 km of additional bathymetric data toward the plane located just SW of Area A. Side scan sonar lines have been recorded with 300 m range per channel and a 5 m bin size final DTM and a 5 m resolution low-frequency mosaic have been delivered.

Corridor C, which joins A and B areas, has been surveyed by a single line planned along the proposed future cable route. The side scan sonar line has been recorded with 300 m range per channel and a 5 m bin size final DTM and a 5 m resolution low-frequency mosaic have been delivered.

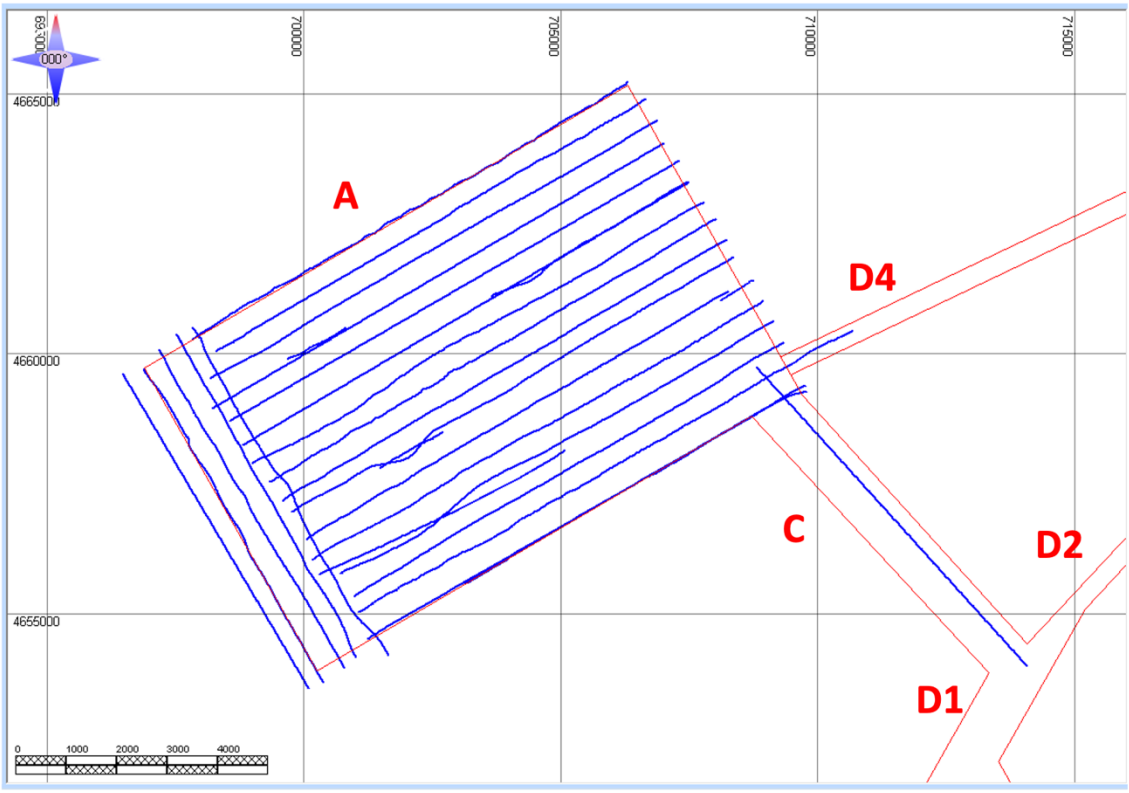


Figure 6.1: Phase I: MBES, SSS, and MAG trackplots in A and C areas.
(red line: survey area; blue line: trackplot)

During the Q/C, both the multibeam and side scan sonar data highlighted the presence of an unknown target close to the northern corner of area A (about 20x10 m). For this reason, an extra-work survey has been planned and carried out on 2023, Feb. 15th (figure 6.2). About 1.6 km of side scan sonar and magnetometer have been run (three lines) to obtain a very high-resolution mosaic (0.05 m) of this small sector.

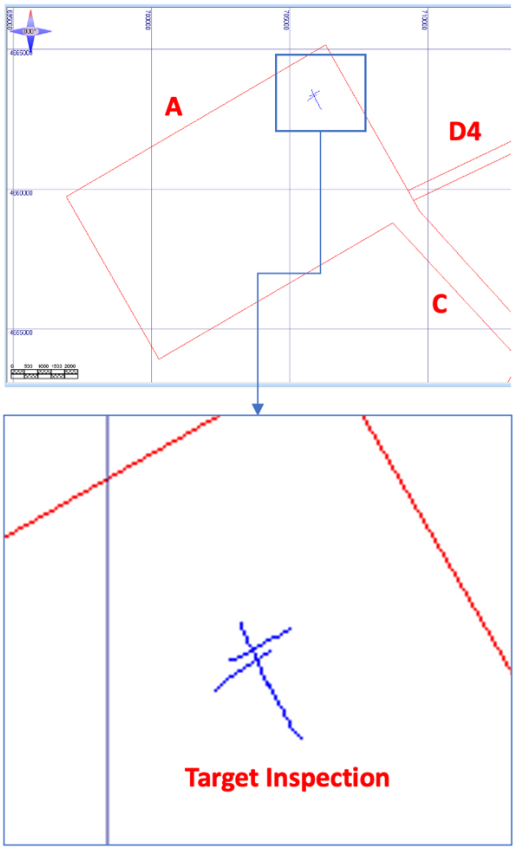


Figure 6.2: Phase I: SSS, and MAG trackplots for target inspection in the area A.
(red line: survey area; blue line: trackplot)

Twenty-three (23) lines have been surveyed to cover **Sector B** (Figure 6.3). During the survey, the crew decided to run the lines in order to have the marine current to bow/stern and to limit the rolling of the vessel. For this reason, the survey lines show three different directional patterns that reflect the main direction of the marine current during the acquisition. Side scan sonar lines have been recorded with 300 m range per channel and a 5 m bin size final DTM and a 5 m resolution low-frequency mosaic have been delivered.

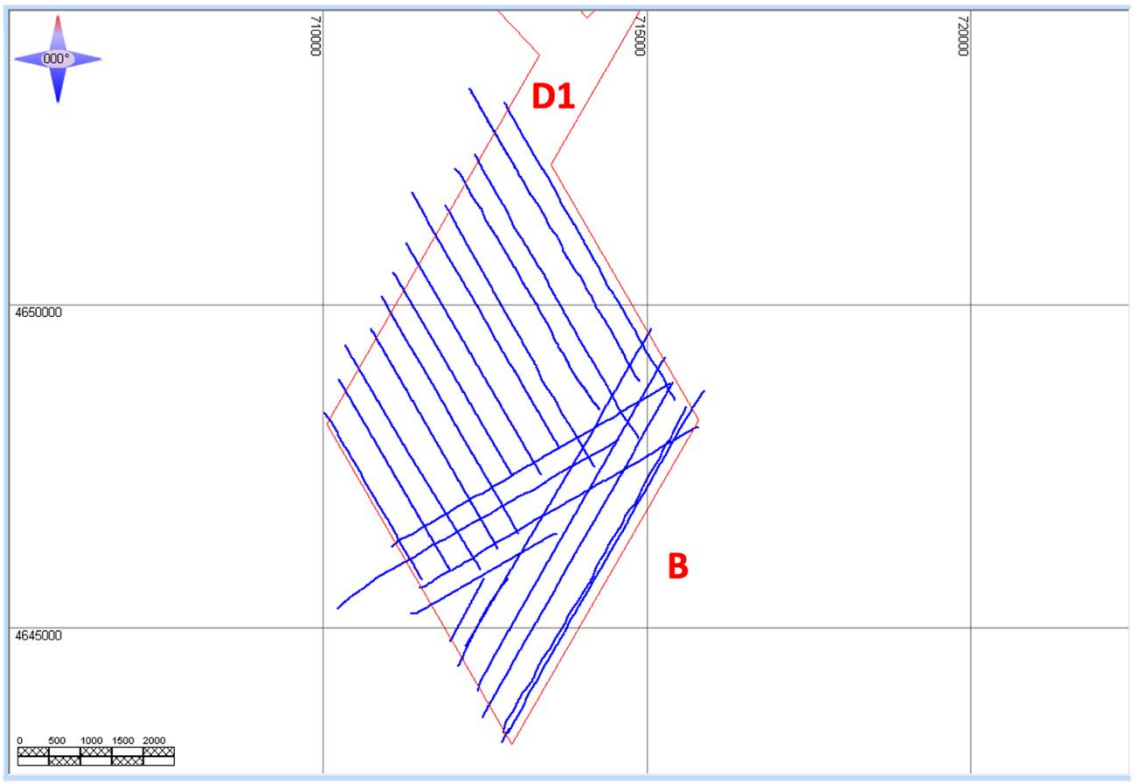


Figure 6.3: Phase I: MBES, SSS, and MAG trackplots in the area B.
(red line: survey area; blue line: trackplot)

The **sector D3** (nearshore) has been surveyed between 10 m and 40 m WD by 13 lines perpendicular to the coastline (Figure 6.4). Additionally, one line parallel to the coast has been recorded to exactly define the 10 m WD limit; this line highlighted an actual limit very different from charted limit (source Navionics), and for this reason, the planned lines were shifted on seaward (Figure 6.4). Side scan sonar lines have been recorded with 75 m range per channel and a 1 m bin size final DTM and a 1 m resolution low-frequency mosaic have been delivered. No seismic data have been recorded for this zone (as defined in the Agreement).

During the nearshore survey, the **shallow parts of corridors D2 and D4** were recorded (Figure 6.4) by single centre lines (side scan sonar range: 300 m per channel). In the D4 sector, it was verified the presence of a buoy (lat. 42.124776°; long. 11.727196°) with about 250 m length floating pipe (Figures 6.4 and 6.5); these objects result located just in the centre of the planned corridor and an interdiction area is present around them (radius: 1000 m considering the buoy position). For this reason, a route development for corridor D4 has been proposed and carried out (see following).

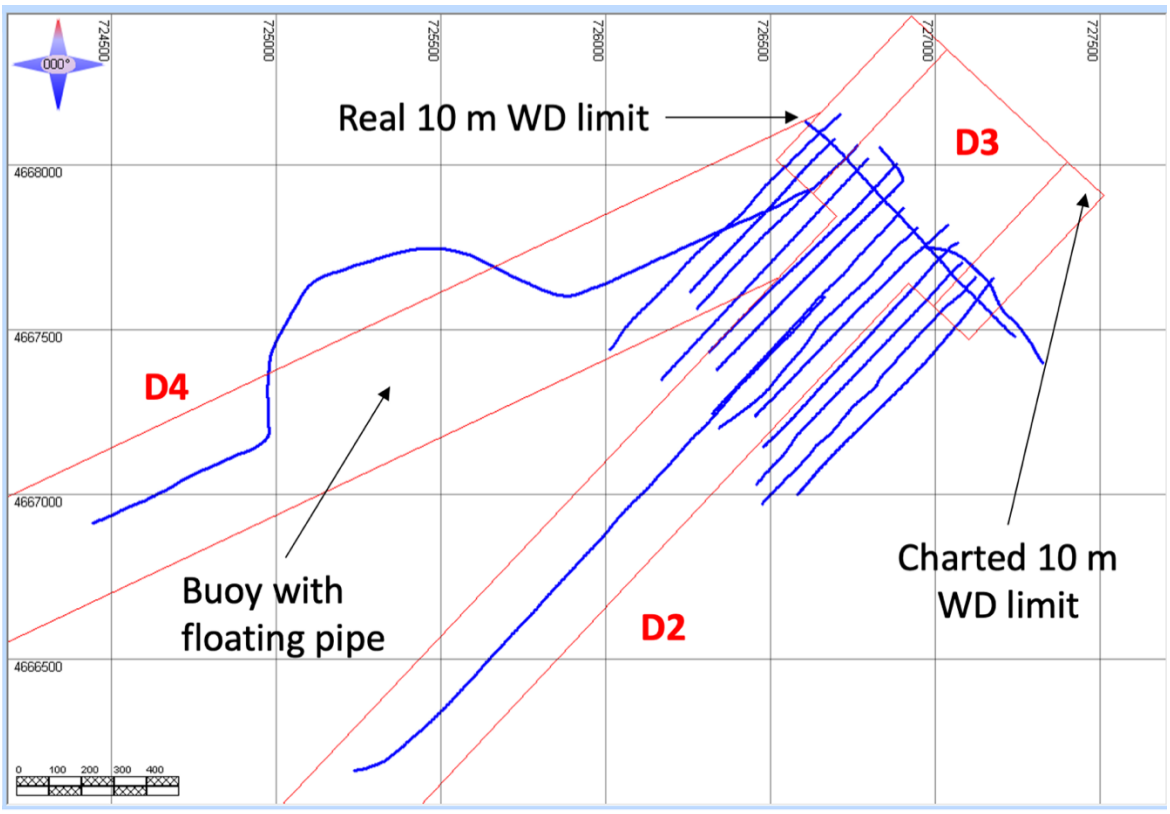


Figure 6.4: Phase I: MBES, SSS, and MAG trackplots in the area D3 (nearshore) and in the shallow part of D2 and D4 corridors.
(red line: survey area; blue line: trackplot)

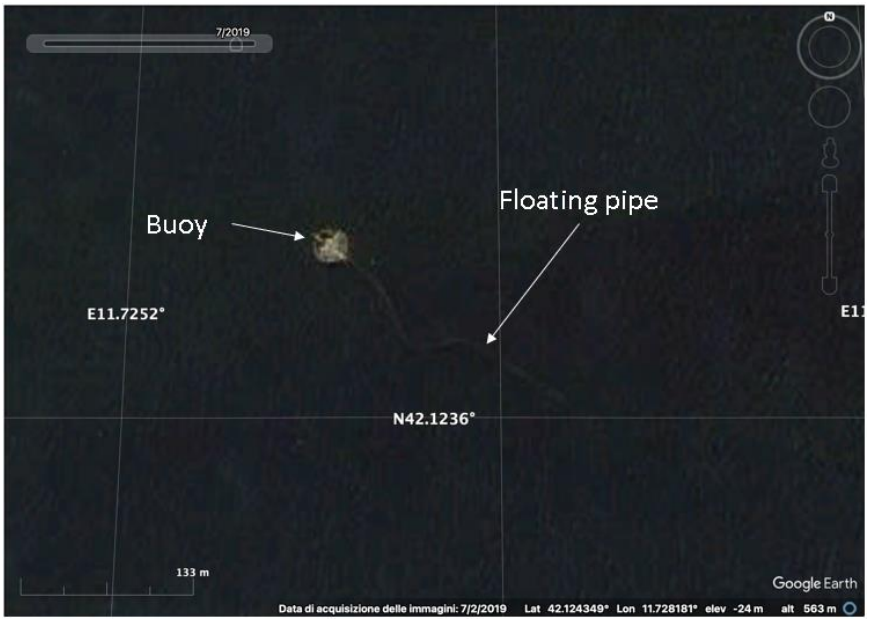


Figure 6.5: Phase I: Satellite image from Google Earth showing the buoy located in corridor D4.

Corridors **D1**, **D2**, and **D4** (Figure 6.6 and Figure 6.7) were acquired by single centre lines (range side scan sonar: 300 m per channel); 5 m bin size final DTM and a 5 m resolution low-frequency mosaic have been delivered.

As previously mentioned, an obstruction is located just in the centre of corridor D4 (buoy and floating pipe); for this reason, a route development was planned. From about 65 m WD, corridor D4 turns eastward to join with corridor D2 at about 50 m WD (Figure 6.7).

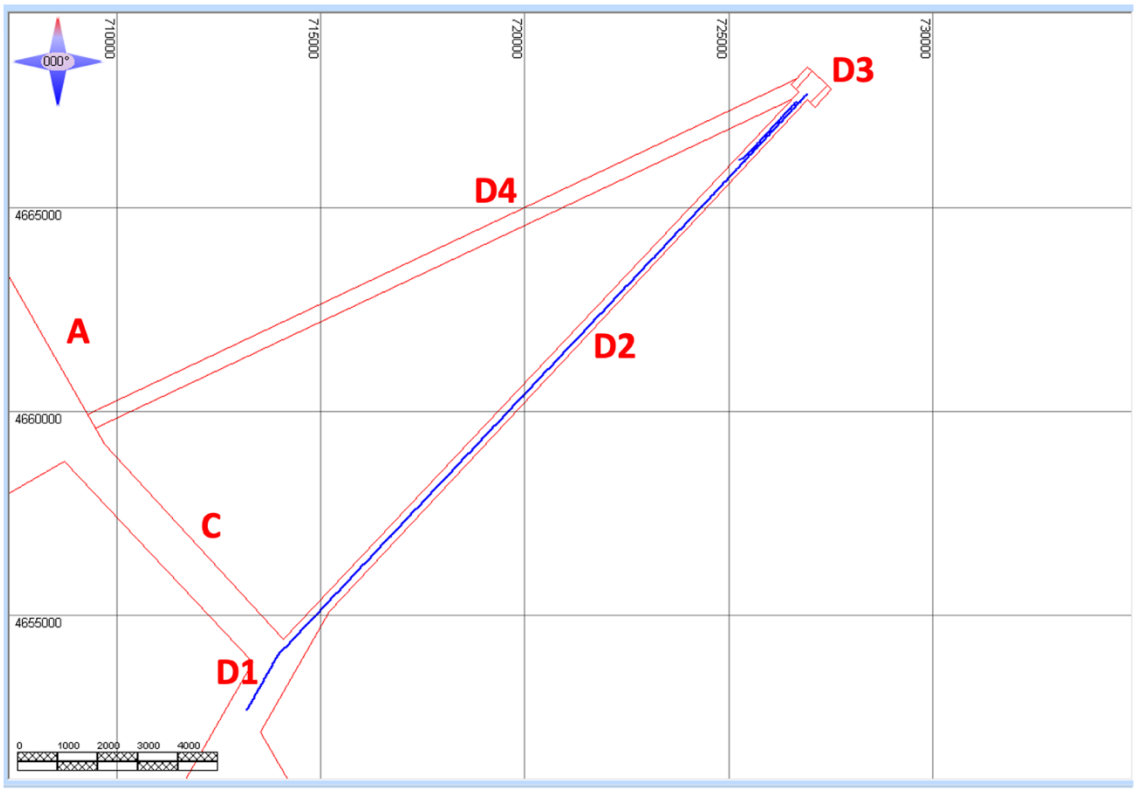


Figure 6.6: Phase I: MBES, SSS, and MAG trackplots in D1 and D2 corridors.
(red line: survey area; blue line: trackplot)

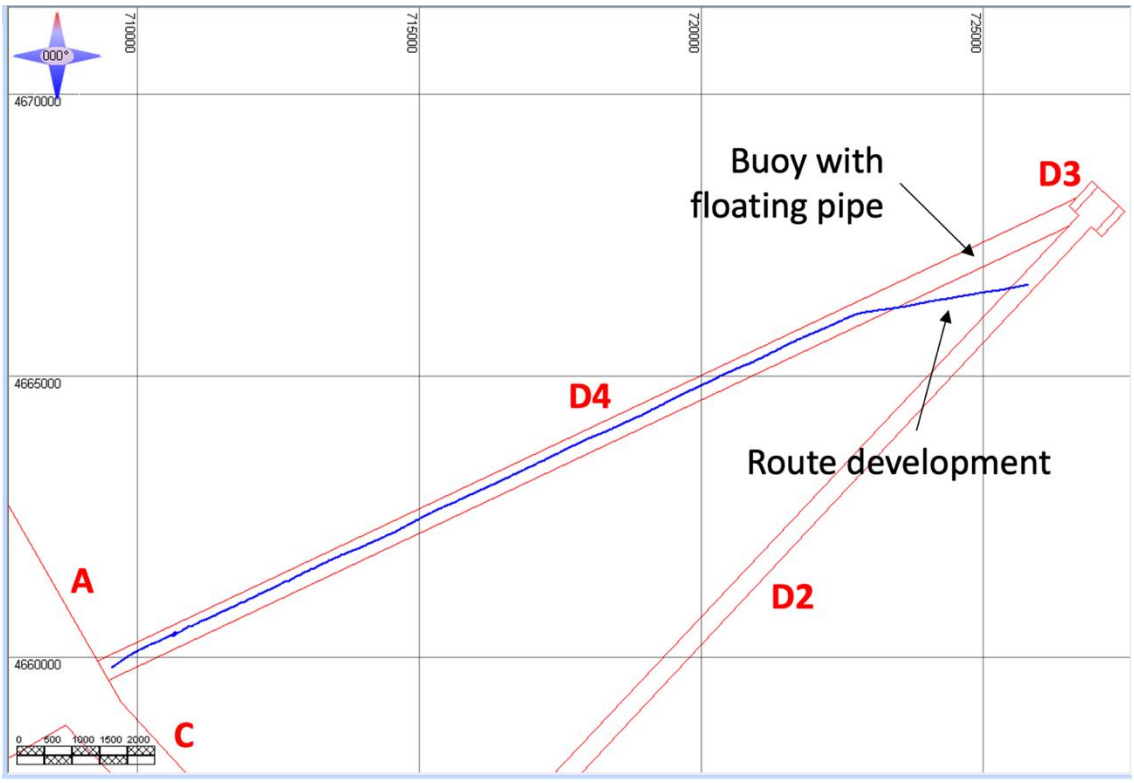


Figure 6.7: Phase I: MBES, SSS, and MAG trackplots in D4 corridor.
(red line: survey area; blue line: trackplot)

During **phase II** (2023, Feb. 16th-20th) about 153.5 km of **sub-bottom profiler** and about 327 km of **sparker**. At the end of the survey, the Client decided to add a number of lines to analyse in deep the canyon sector between the A and B areas; additionally, a number of lines were planned to correlate the geologic structures between the different survey zones. For this reason, supplementary 114 km of sub-bottom and 114 km of sparker lines were recorded between 2023, Feb. 21st and 2023, Feb. 24th.

During the survey, 17 lines of sub-bottom profiler were recorded (Figure 6.8): 8 lines in the A sector, 6 lines in the B sector, 1 single centre line in corridor C and one single centre line in corridor D1. One more line was acquired along the axis of the main canyon between A and B zones.

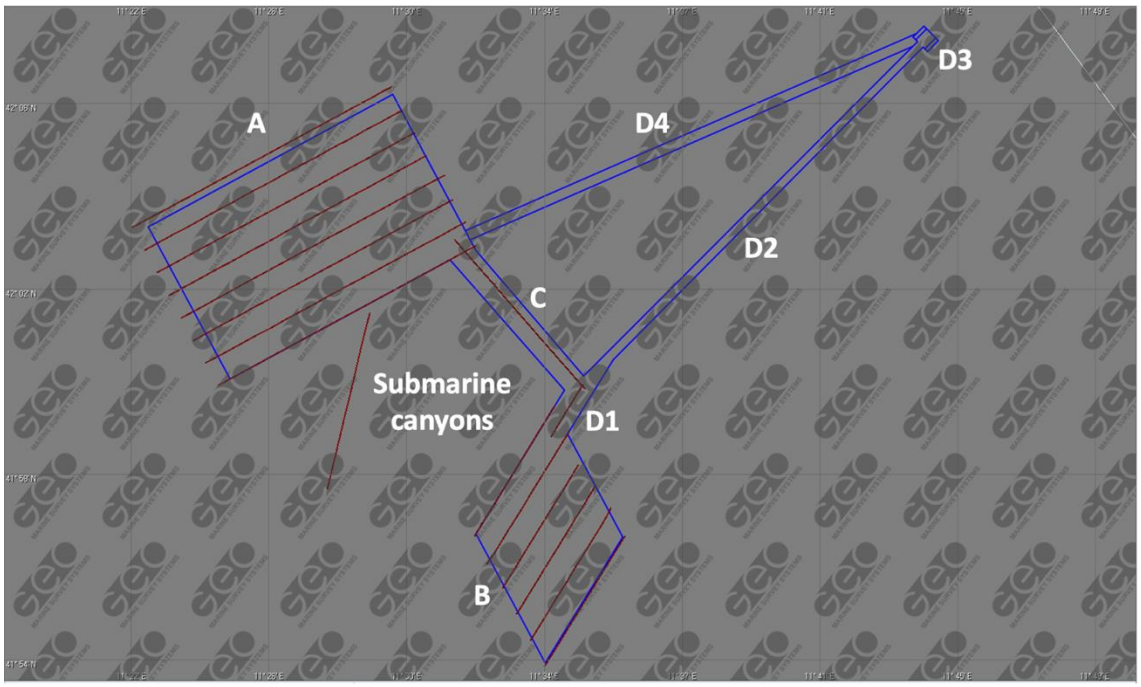


Figure 6.8: Phase II: SBP trackplots.
(red line: trackplot area; blue line: survey area).

Additionally, 22 sparker lines were collected (Figure 6.9): 8 lines in sector A, 6 lines in sector B, one single centre line in corridor C, and one single centre line in corridor D1. Moreover, 6 records are collected in the canyon zone, between A and B.

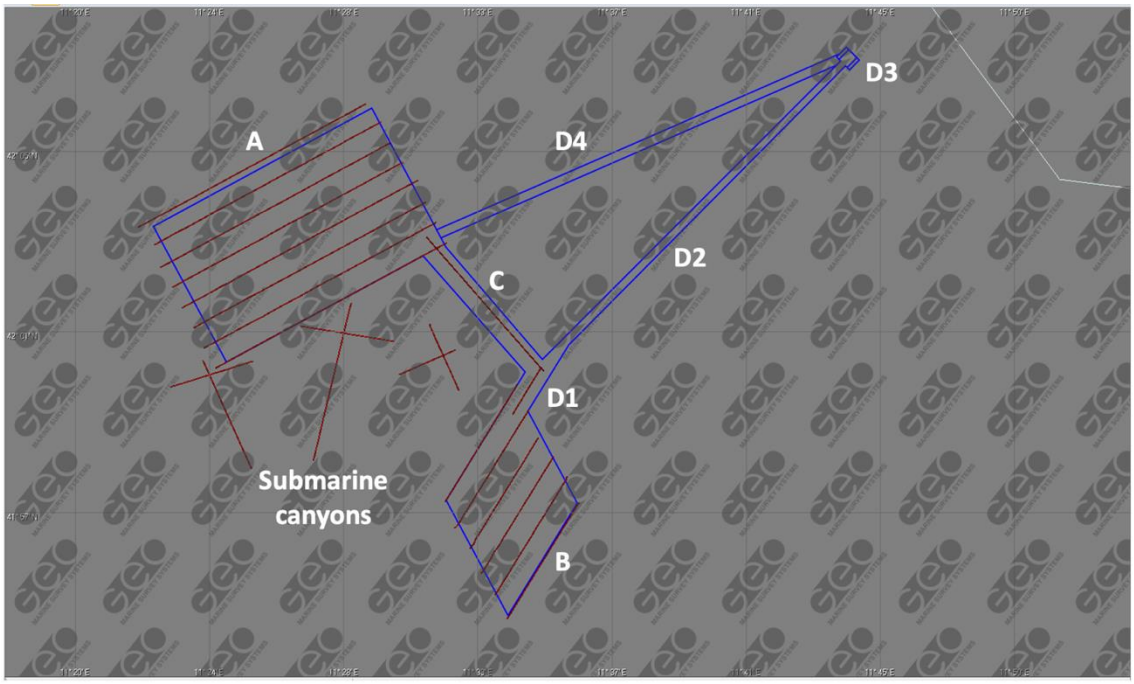


Figure 6.9: Phase II: SBP trackplots.
(red line: trackplot area; blue line: survey area)

As previously mentioned, an extra-work was carried out. During this phase, 10 seismic lines were collected (Figure 6.10): 3 extensions of the lines previously acquired along the canyons; 3 crossing lines in A and B areas; two lines that cross A, B, C, D1, and D2 to have cross-correlation between these zones; one centre line in corridor D2 and one centre line in D4.

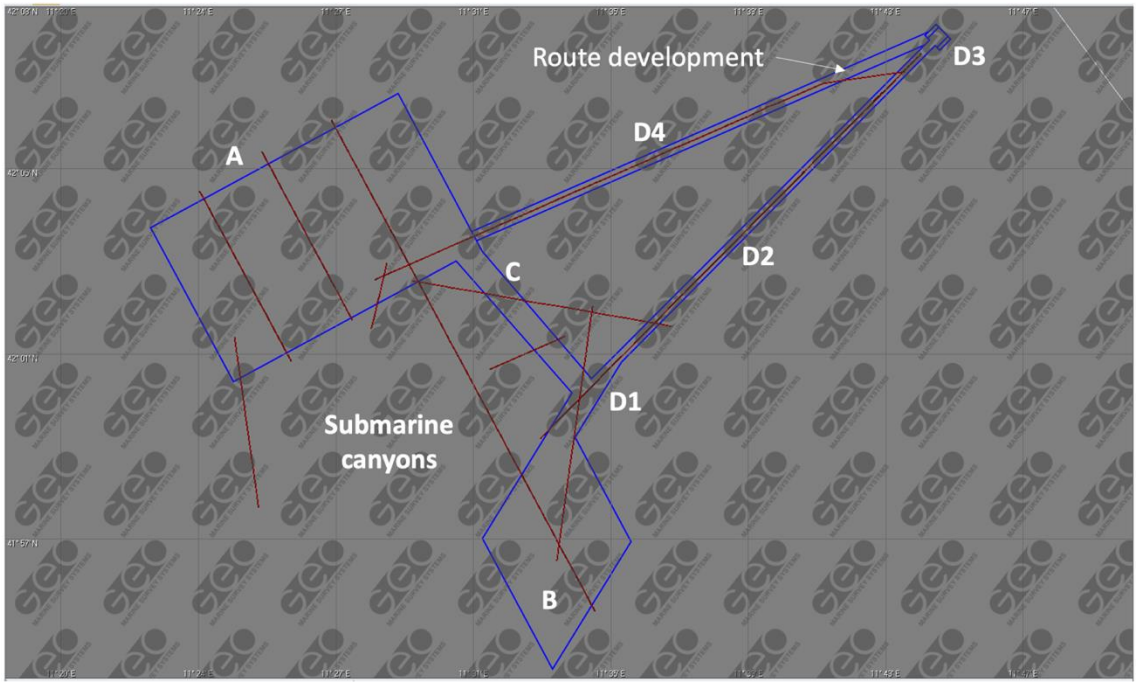


Figure 6.10: Phase II: SBP and SKP extra-work trackplots.
(red line: trackplot area; blue line: survey area)

6.2 VISUAL INSPECTION AND SAMPLING SURVEY

Phase III included both a visual inspection and a sampling survey. The visual inspection was conducted between 2023, March 2nd and 5th (including ROV mobilisation and demobilisation), whereas sampling activities were carried out on 2023, March 12th and 13th.

6.2.1 Collected data

During the **visual inspection**, about 4.950 km of data have been recorded. SD and HD cameras have been used, in addition to a GoPro.

In the nearshore, about 3.7 km of video has been recorded. In this sector, 5 lines were planned, but only 4 lines have been recorded (Figure 6.11).

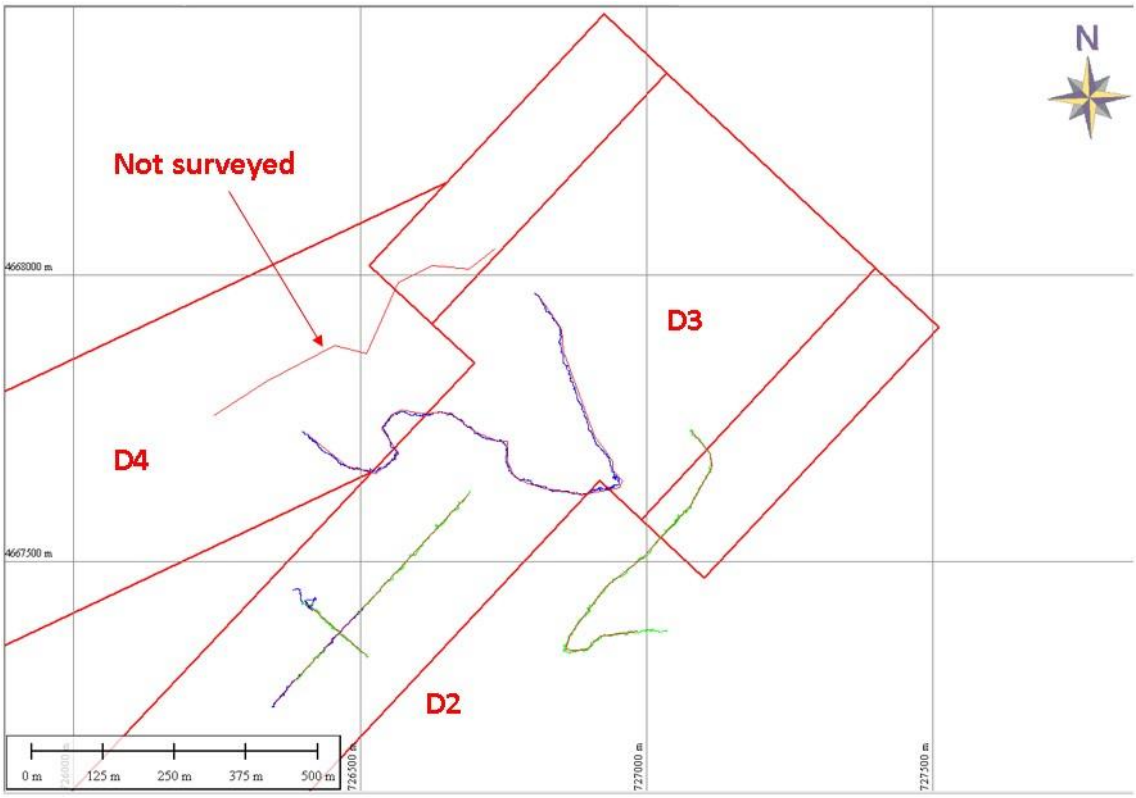


Figure 6.11: Phase III: nearshore ROV trackplots; comparison between planned and surveyed lines. (red line: as planned; blue and green line: as recorded)

In the offshore zone, a specific survey in the target inspection sector (Area A - see also par. 6.1.2) has been performed (about 1.2 km). A regular grid was planned to survey the area, in addition to 4 isolated points located close to the target (Figure 6.12).

During the survey, it was not possible to follow exactly the planned survey due to the marine currents and cause of the unexpected strong asymmetry of the target. For this reason, the actual trackplots show a slight north-westward shift because the onboard technicians tried to follow the real shape of the target. Due to the lack of time, it was not possible to survey the isolated targets (as planned).

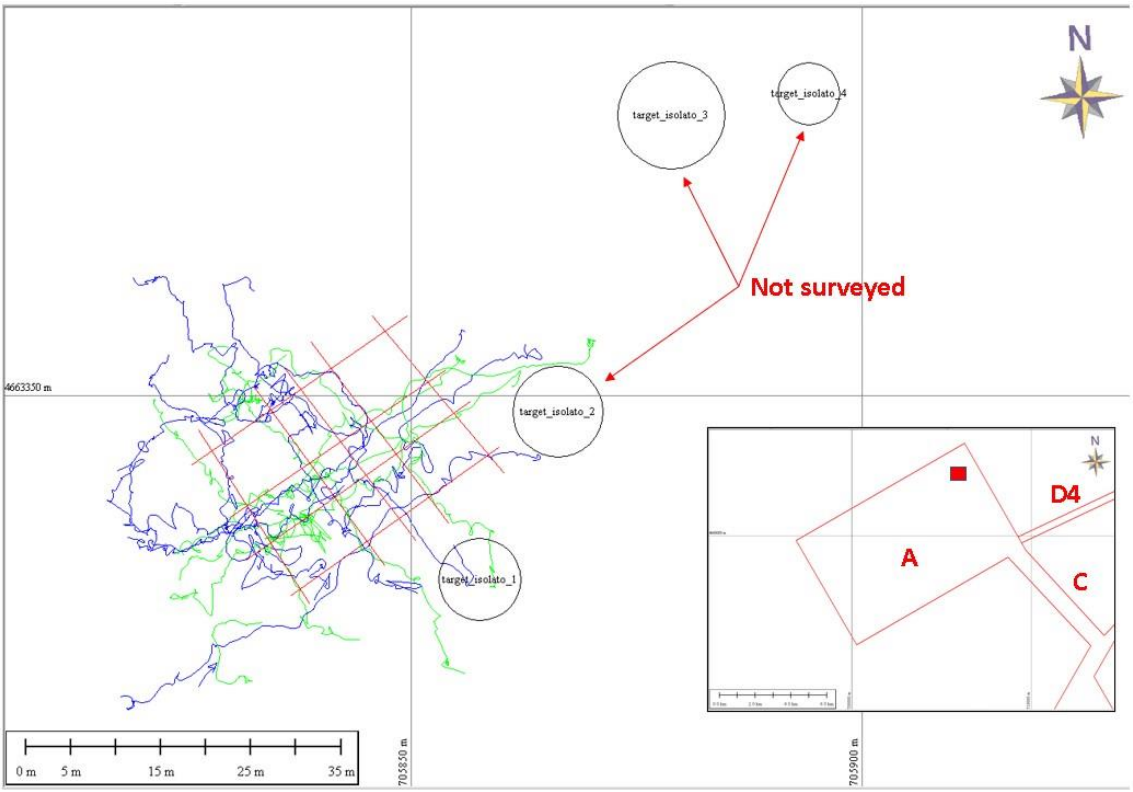


Figure 6.12: Phase III: offshore ROV trackplots; comparison between planned and surveyed lines. (red line: as planned; blue and green line: as recorded; black ring: isolated target)

The Client proposed **12 sampling points** between the nearshore sector and the shallow part of corridors D2 and D4 (sedimentological sampling, Benthos and ecotoxicological station). The samplings closest to the coastline (TWE_NN1 and TWE_NN2 in Figure 6.13) were rejected because out of the multibeam surveyed sector, whereas all the TWE_001 sampling attempts resulted in an empty grab.

Table 6.2 summarises the sampling activities, whereas Figures 6.13 to 6.16 show the point locations in the survey areas.

Table 6.1: Sampling survey resume.

ID	TYPE	AS-PLANNED		AS-DONE		DEPTH (m)	NOTE
		E – UTM32	N- UTM32	E – UTM32	N- UTM32		
TWE_G01	S	726798	4667769	-	-	23	empty
	R1			-	-		empty
	R2			-	-		empty
TWE_G02	S	726686	4667613	726688.36	4667614.95	32	
	R1			726688.36	4667614.95		
	R2			726686.23	4667617.14		
TWE_G03	S	726508	4667469	726504.29	4667464.56	38	
	R1			726504.29	4667464.56		
	R2			726503.47	4667475.22		
TWE_G04	S	726202	4667148	726209.63	4667144.57	45	ecotoxicological station
	R1			726209.63	4667144.57		
	R2			-	-		empty
	R2_A			-	-		empty
TWE_G05	S	726198	4667091	726198.42	4667090.28	45	
	R1			726202.01	4667088.90		
	R2			726198.99	4667091.82		
TWE_G06	S	725727	4666587	725734.52	4666581.42	50	
	R1			725724.81	4666583.16		
	R2			725727.53	4666586.66		
TWE_G07	S	724067	4666302	724071.46	4666306.29	58	ecotoxicological station
	R1			724071.46	4666306.29		
	R2			724073.06	4666309.54		
TWE_G08	S	724629	4665413	724627.07	4665416.48	57	ecotoxicological station
	R1			724627.07	4665416.48		
	R2			724629.42	4665413.27		
TWE_G09	S	723448	4664149	723448.47	4664154.30	71	
	R1			723448.47	4664154.30		
	R2			723446.39	4664151.09		
TWE_G10	S	722375	4665919	722369.84	4665923.70	70	
	R1			722369.84	4665923.70		
	R2			722372.18	4665919.89		

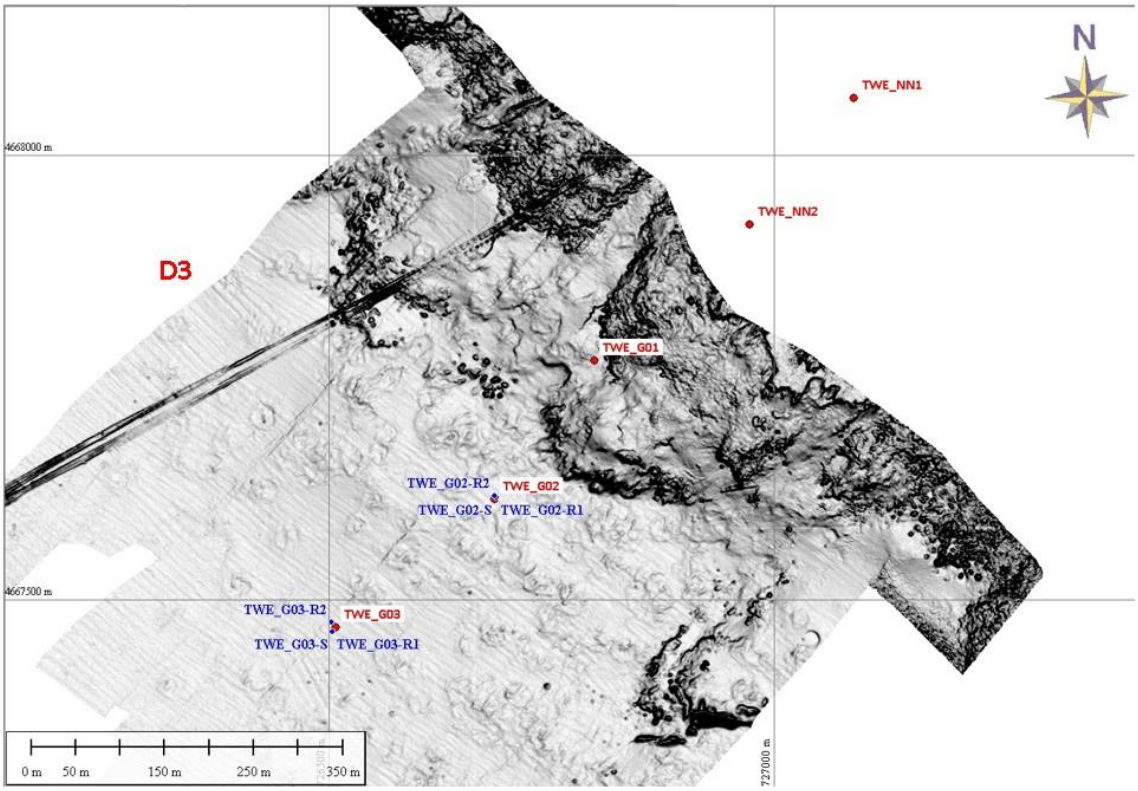


Figure 6.13: Phase III: sampling location in the nearshore sector.
(red point: as planned; blue point: as done sampling)

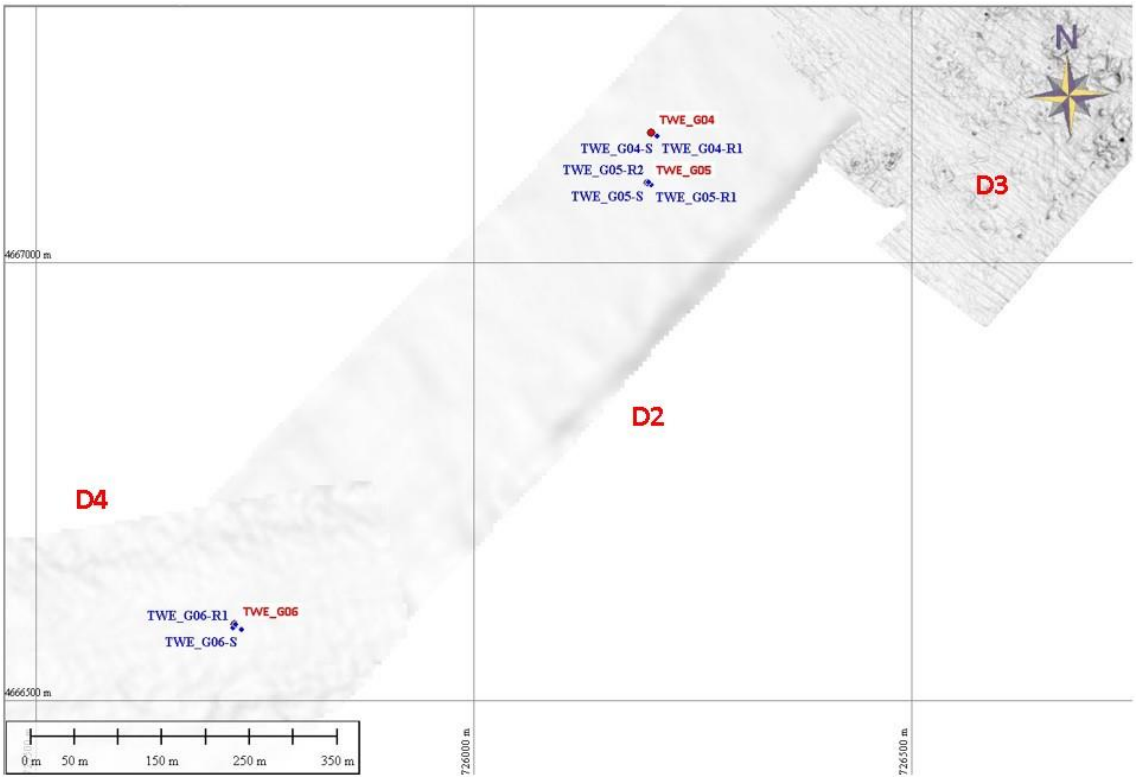


Figure 6.14: Phase III: sampling location in the shallow sector of corridor D2.
(red point: as planned; blue point: as done sampling)

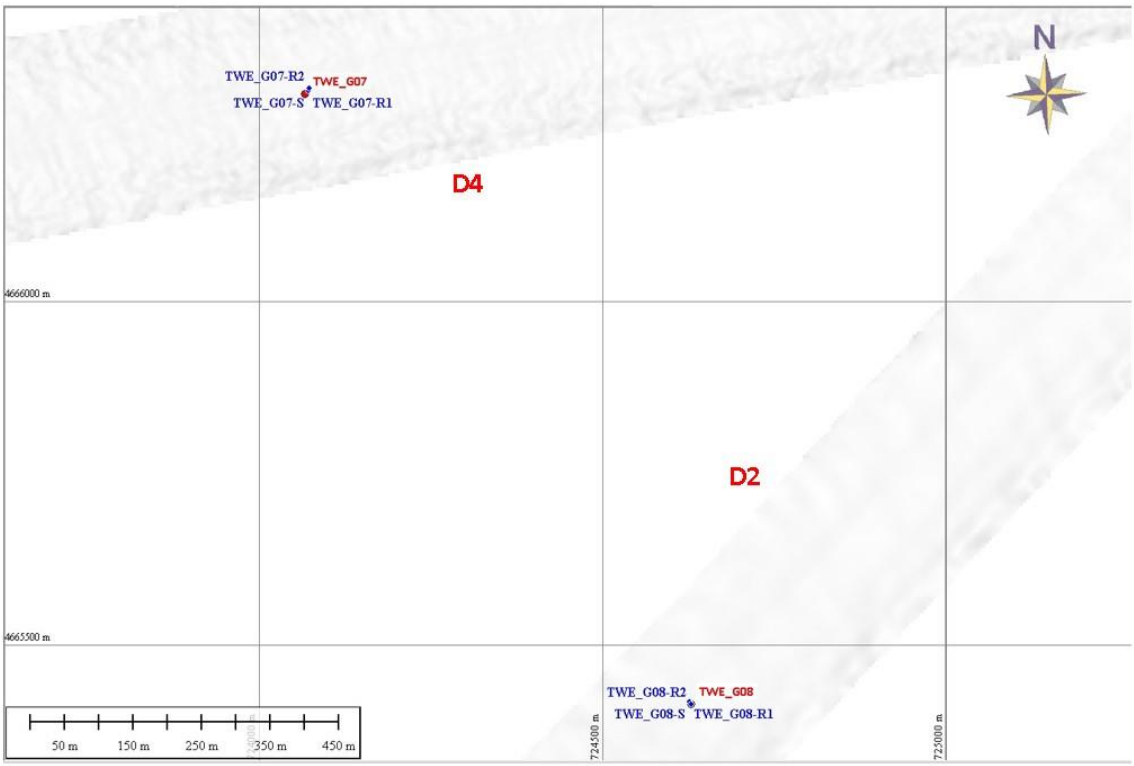


Figure 6.15: Phase III: sampling location in the distal sector of corridor D2 and D4.
(red point: as planned; blue point: as done sampling).

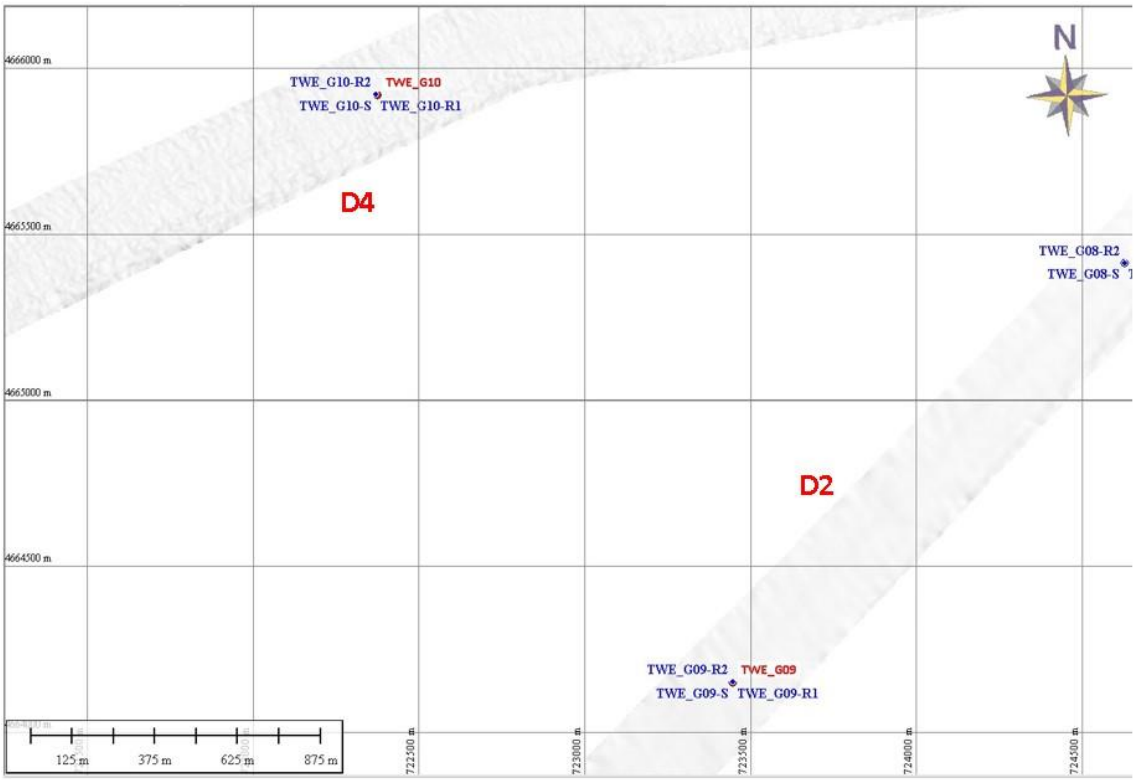


Figure 6.16: Phase III: sampling location in the distal sector of corridor D2 and D4.
(red point: as planned; blue point: as done sampling)

7. CALIBRATIONS

7.1 USBL CALIBRATION

The USBL Calibration was performed on 2022, Nov. 25th; the results are reported below.

USBL Calibration Utility 25/11/2022 09:02:46 Page 1 of 5

Least Squares

LEAST SQUARES DEFINITIONS

Databases

C:\Users\User\QPS-Data\Projects\P_22040-7SWP_Tyrrhenian_SUR		
0022 - E-W_1 - 0001	11/25/2022	07:34:44
0024 - E-W_2 - 0001	11/25/2022	07:45:06
0025 - D_2 - 0001	11/25/2022	07:51:34
0026 - D_1 - 0001	11/25/2022	07:56:24
0027 - N-S_1 - 0001	11/25/2022	08:03:25
0028 - N-S_2 - 0001	11/25/2022	08:09:24
0029 - N-S_2 - 0001	11/25/2022	08:13:25
0030 - E-W_2 - 0001	11/25/2022	08:20:59
0031 - D_2 - 0001	11/25/2022	08:25:45
0032 - N-S_1 - 0001	11/25/2022	08:35:33
0033 - D_1 - 0001	11/25/2022	08:41:47
0034 - E-W_1 - 0001	11/25/2022	08:49:04

Properties

Object Name	**ORCAII**		
USBL System	**USBL**	Reference Point	**USBL**
Transducer Node	**USBL**	Target Node	**SSS_Beacon**
Gyro System	**Priority**	VRU System	**Priority**
Echosounder	**Manual**	Computation	**Applanix POSITION**

Statistics

Number of USBL Observations	**1646**	**100** %
Number of Used Observations	**1565**	**95** %
Number of Disabled Observations	**81**	**4** %

LEAST SQUARES SETTINGS

USBL Observations

Alignment Corrections	**No Corrections**
Reference Point	**Actual USBL Transducer**
Sound Velocity	**Calibrated Sound Velocity**
Computation Parameters	**Scale, Angles (Roll, Pitch, Heading)**
Standard Deviations	**Scaled Calibration Standard Deviations**

Qinsy 9.4.2.2021.06.28.1 QPS BV

Least Squares

LEAST SQUARES RESULTS

Computation Results

Parameter	Value	SD
Scale Factor	**0.98921**	**0.01558**
Roll Angle	**0.385** °	**1.245** °
Pitch Angle	**-0.361** °	**0.985** °
Heading Angle	**0.890** °	**1.019** °

Target Node Position

Coordinate	Value	SD
Easting TP	**729678.03** m	**N/A** m
Northing TP	**4658683.00** m	**N/A** m
Height TP	**-47.84** m	**N/A** m

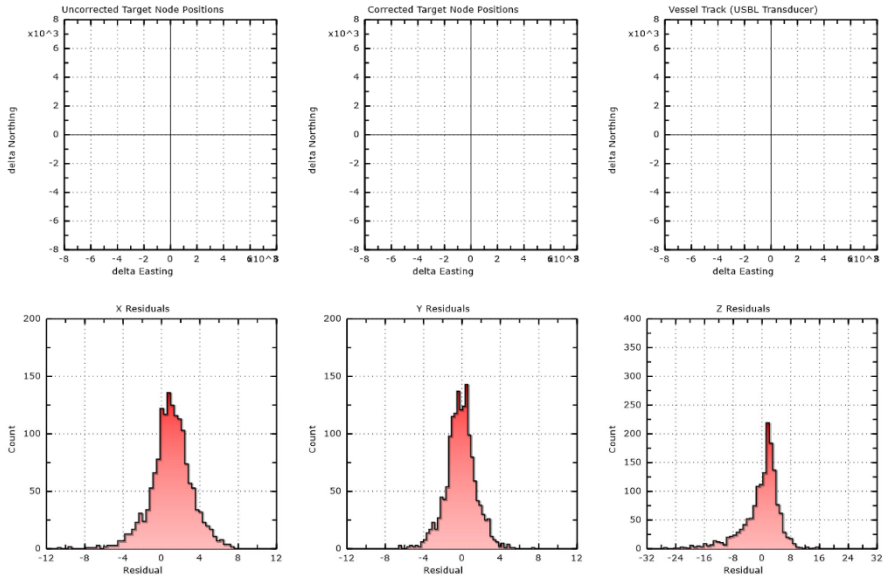
Target Nodes

Known Target Node Positions

Name	Easting	Northing	Height
None Defined			

Least Squares

LEAST SQUARES GRAPHS



Graph Origin	
Coordinate	Value
Easting	**0.00** m
Northing	**0.00** m
Height	**0.00** m
Calibrated Target Node Position	

Sound Velocity

USBL Observations

Sound Velocity	**Calibrated Sound Velocity**

USBL Calibration Results

Parameter	Value	Factor
Calibration Results	**1503.59** m/s	**0.98921**
Manually Set Values	**N/A**	

QINSy Database Settings

Parameter	Value	Factor
System-Used Velocity	**1520.00** m/s	**1.00000**
Calibrated Velocity	**1520.00** m/s	**1.00000**

0022 - E-W_1 - 0001
0024 - E-W_2 - 0001
0025 - D_2 - 0001
0026 - D_1 - 0001
0027 - N-S_1 - 0001
0028 - N-S_2 - 0001
0029 - N-S_2 - 0001
0030 - E-W_2 - 0001
0031 - D_2 - 0001
0032 - N-S_1 - 0001
0033 - D_1 - 0001
0034 - E-W_1 - 0001

Alignments

USBL Calibration Results

Parameter	Value	SD
Scale Factor	**0.98921**	**0.01558**
Roll Angle	**0.385** °	**1.245** °
Pitch Angle	**-0.361** °	**0.985** °
Heading Angle	**0.890** °	**1.019** °
Offset X	**0.00** m	**N/A** m
Offset Y	**0.00** m	**N/A** m
Offset Z	**0.00** m	**N/A** m
Easting TP	**0.00** m	**N/A** m
Northing TP	**0.00** m	**N/A** m
Height TP	**0.00** m	**N/A** m

USBL Target Node Positions

Error Ellipse	95 %	SD
Easting Center	**729677.68** m	**1.81** m
Northing Center	**4658683.28** m	**2.01** m
Semi-Major Axis	**4.94** m	**2.02** m
Semi-Minor Axis	**4.40** m	**1.80** m
Azimuth Major Axis	**13.508** °	
Grid Scale East	**1.00025**	
Grid Scale North	**1.00025**	

QINSy Database Settings

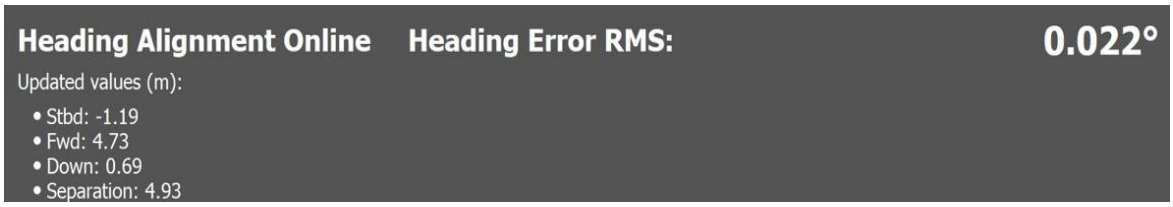
Parameter	Value	SD
Scale Factor	**1.00000**	**N/A**
Roll Angle	**0.000** °	**0.050** °
Pitch Angle	**0.000** °	**0.050** °
Heading Angle	**0.000** °	**0.500** °

0022 - E-W_1 - 0001
0024 - E-W_2 - 0001
0025 - D_2 - 0001
0026 - D_1 - 0001
0027 - N-S_1 - 0001
0028 - N-S_2 - 0001
0029 - N-S_2 - 0001
0030 - E-W_2 - 0001
0031 - D_2 - 0001
0032 - N-S_1 - 0001
0033 - D_1 - 0001
0034 - E-W_1 - 0001

7.2 GYRO VERIFICATION

The M/B Orca II gyro have been verified using the GAMS method, consisting in recording the gyro value while the vessel is performing and eight shape at constant speed. The system is computing then the value against the reciprocal position of the two antennae.

Table 7.1: Gyro correction summary



7.3 MULTIBEAM ECHO SOUNDER

Calibration of Norbit Winghead multibeam was performed at a seabed characterized by the presence of a topographic high to record calibration lines for time, pitch and heading; a flat bottom was selected for the roll.

At the beginning of the job (Nov. 2022), two different MBES Calibration have been done due to problems with the pole. A new calibration was performed on Feb. 2023, when the survey was restarted after Christmas Time.

The results are reported in tables and figures below.

Table 7.2: MBES calibration results (2022, Nov.24th).

Date	Pitch Error (°)	Roll Error (°)	Heading Error (°)
24/11/2022	-0.508	0.440	-0.600

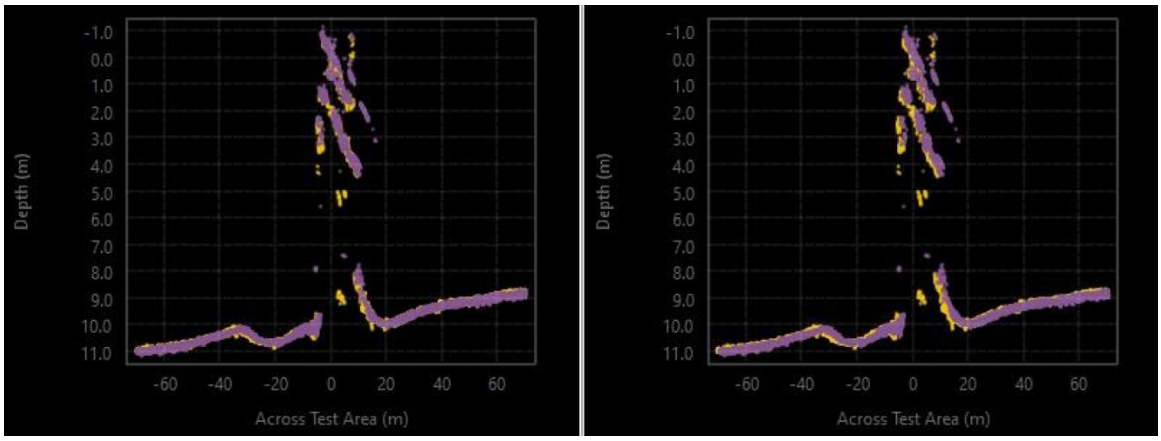


Figure 7.1: Pitch Calibration - before correction left and after correction right (2022, Nov.24th).

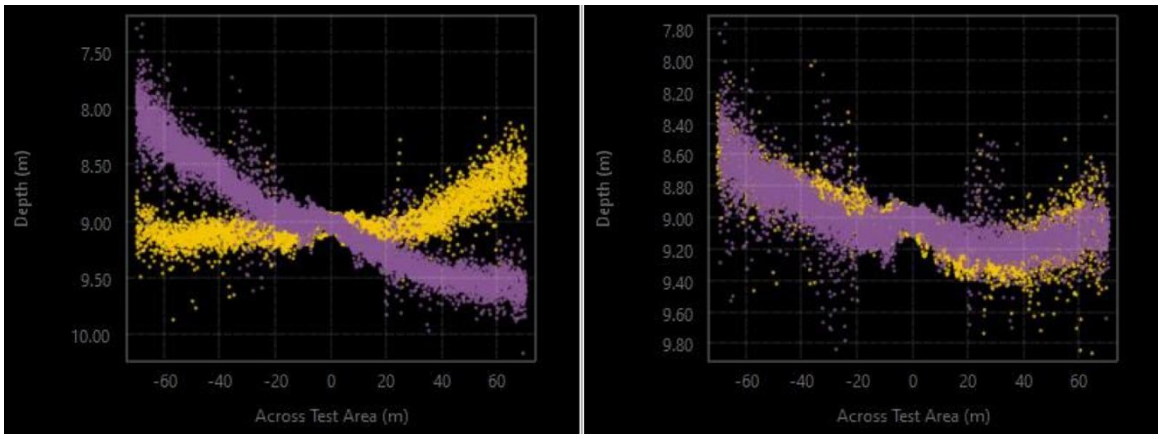


Figure 7.2: Roll Calibration - before correction left and after correction right (2022, Nov.24th).

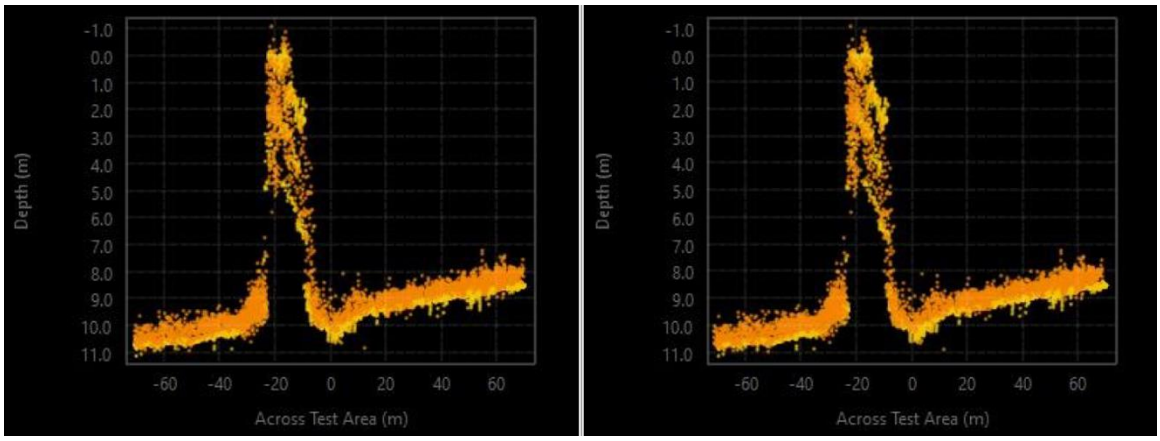


Figure 7.3: Heading Calibration - before correction left and after correction right (2022, Nov.24th).

Table 7.3: MBES calibration results (2022, Nov.28th).

Date	Pitch Error (°)	Roll Error (°)	Heading Error (°)
28/11/2022	0.265	0.280	0.616

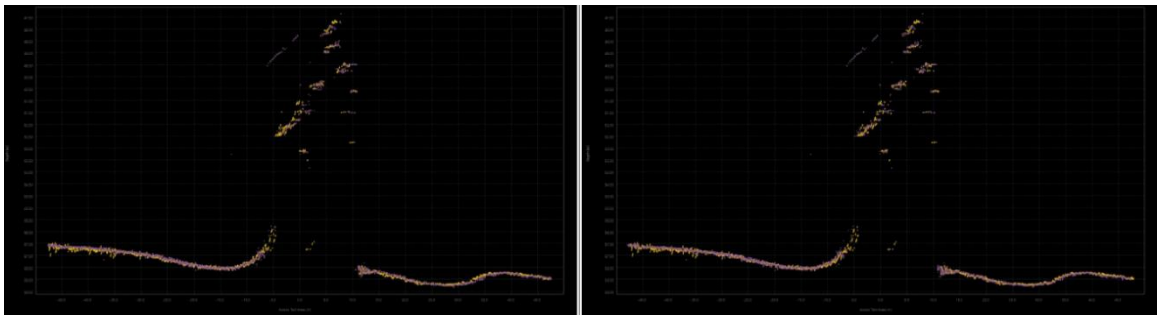


Figure 7.4: Pitch Calibration - before correction left and after correction right (2022, Nov.28th).

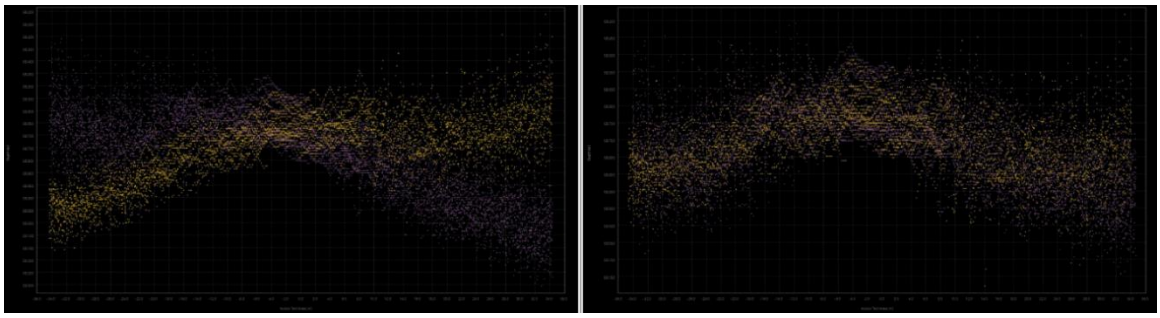


Figure 7.5: Roll Calibration - before correction left and after correction right (2022, Nov.28th).

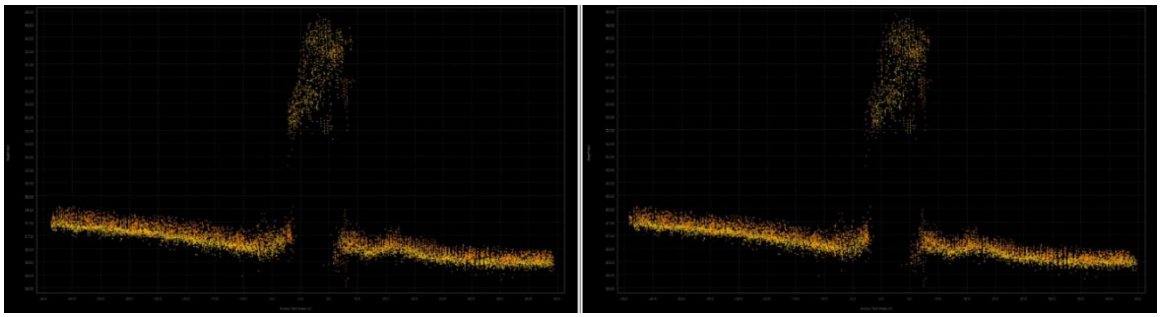


Figure 7.6: Heading Calibration - before correction left and after correction right (2022, Nov.28th).

Table 7.4: MBES calibration results (2023, Feb.2nd).

Date	Pitch Error (°)	Roll Error (°)	Heading Error (°)
02/02/2023	0.555	0.248	4.132

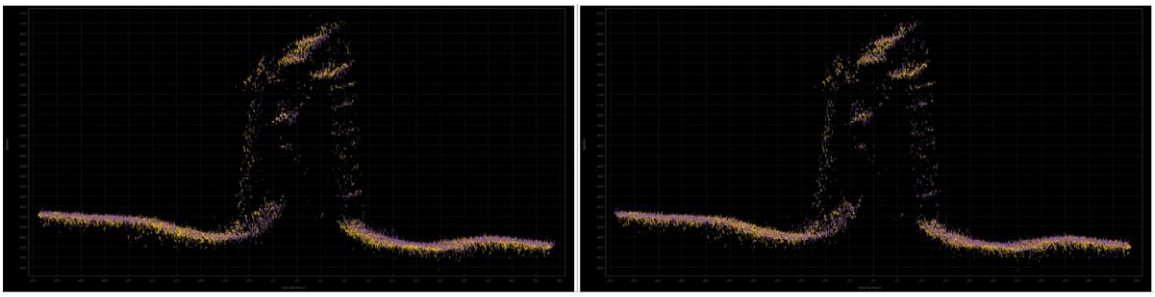


Figure 7.7: Pitch Calibration - before correction left and after correction right (2023, Feb.2nd).

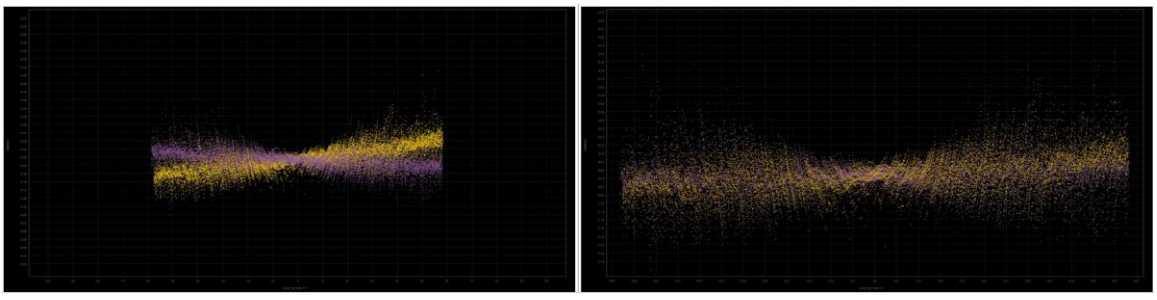


Figure 7.8: Roll Calibration - before correction left and after correction right (2023, Feb.2nd).

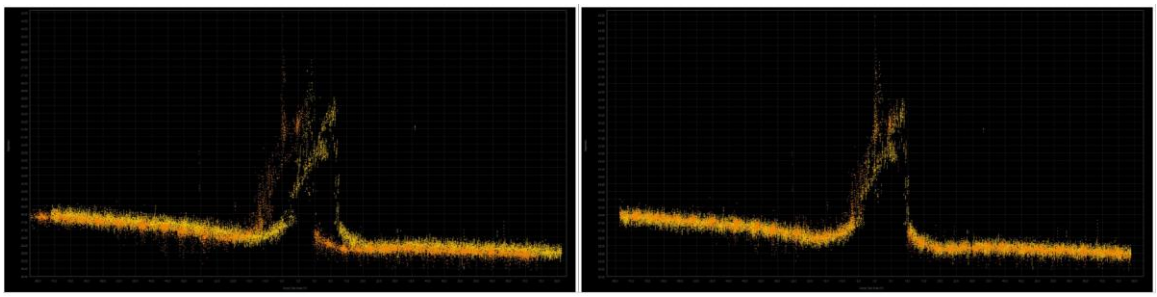


Figure 7.9: Heading Calibration - before correction left and after correction right (2023, Feb.2nd).

7.4 SIDE SCAN SONAR DRY & WET TEST

The SSS channels have been tested on deck with the Rub-Test on each channel. Once done and verified the towfish has been tested in the water confirming its operativity.

Figure 7.10: Side Scan Sonar Wet-Test (2022, Nov. 20th).

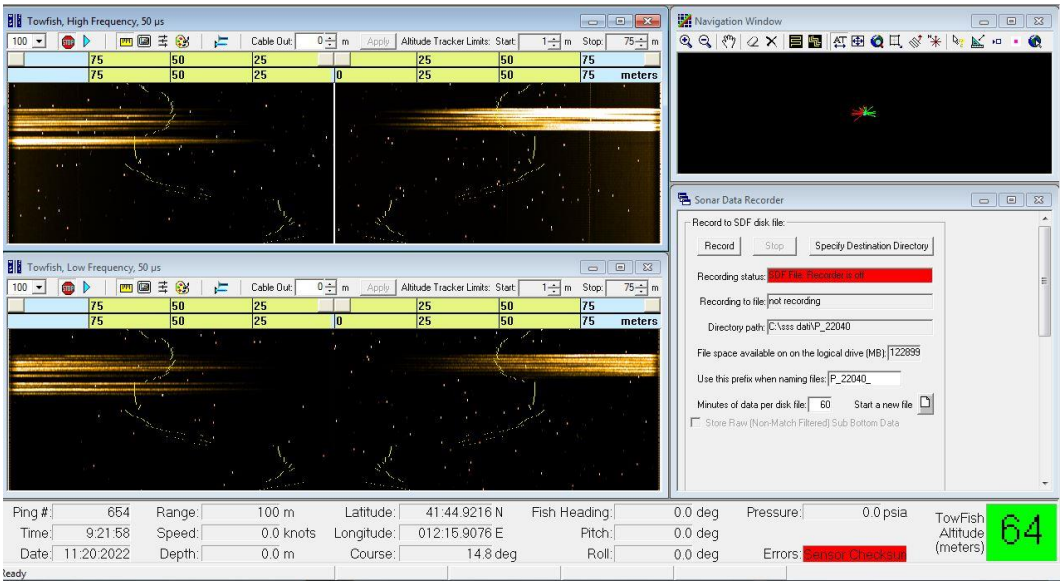


Figure 7.11: Side Scan Sonar Rub-Test (2022, Nov. 20th).

7.5 MAGNETOMETER DRY TEST

The magnetometer has been tested on deck. The results are shown below.

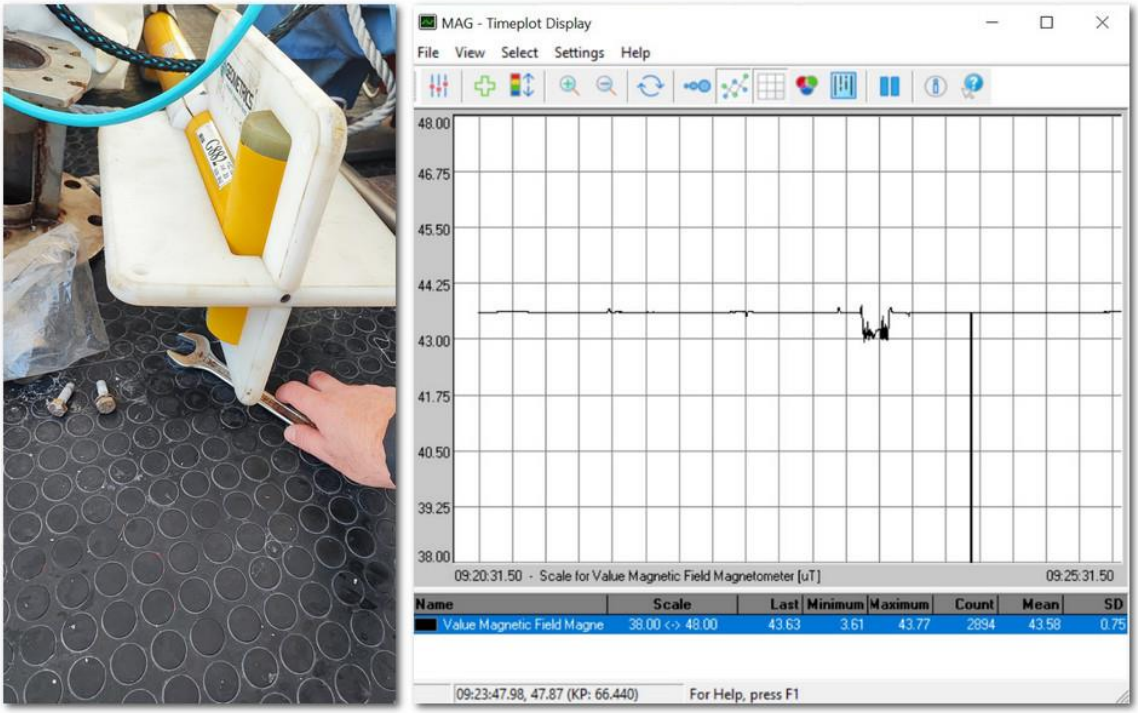


Figure 7.12: Magnetometer Dry-Test (2022, Nov. 20th).

8. QC AND WORFLOW PROCESSING

8.1 SOFTWARE

The following is a list of the software used to process the data:

Table 8.1: Post-processing software.

Software	Version	Data
QPS QIMERA	2.4.3	MBES, SVP
Chesapeake SonarWIz	7.09.04 x64	SSS, Magnetometer, Sub-bottom Profiler
GeoMarine GeoSuite AllWorks	2.6.6815.16220	Sub-bottom Profiler, Sparker

8.2 MULTIBEAM ECHO SOUNDER

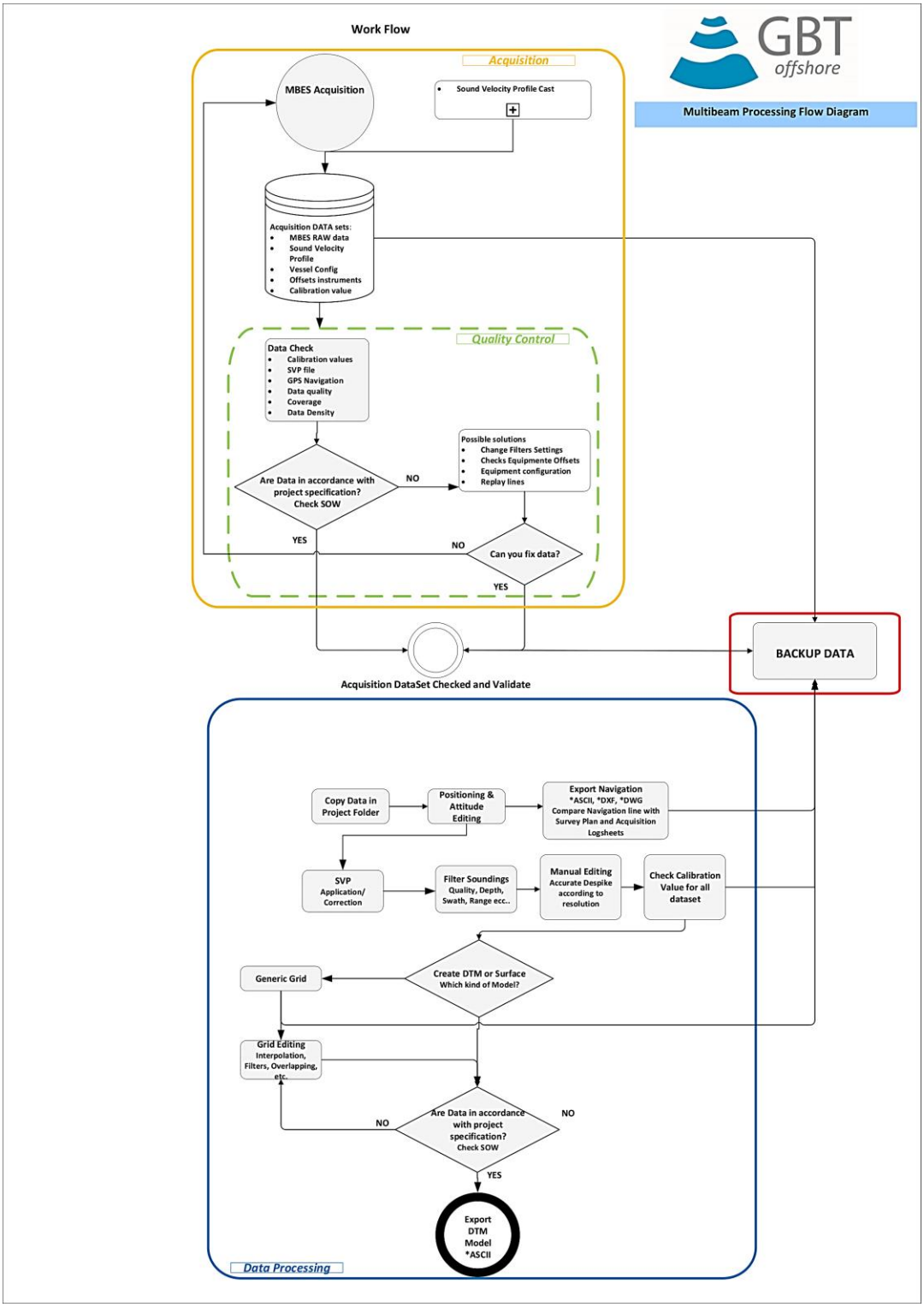


Figure 8.1: Multibeam Processing Flow Chart

8.3 SIDE SCAN SONAR

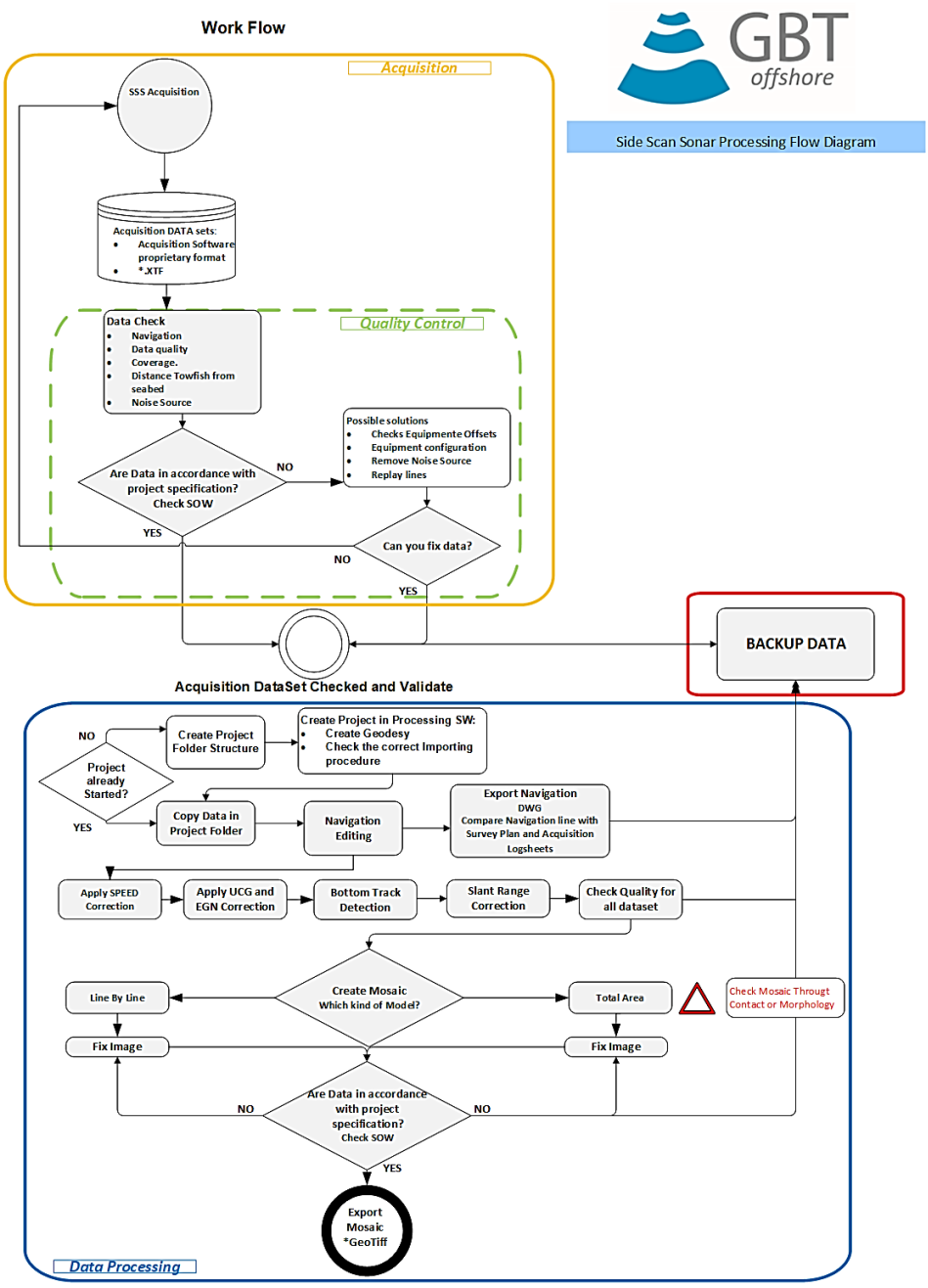


Figure 8.2: Side Scan Sonar Processing Flow Chart

8.4 MAGNETOMETER

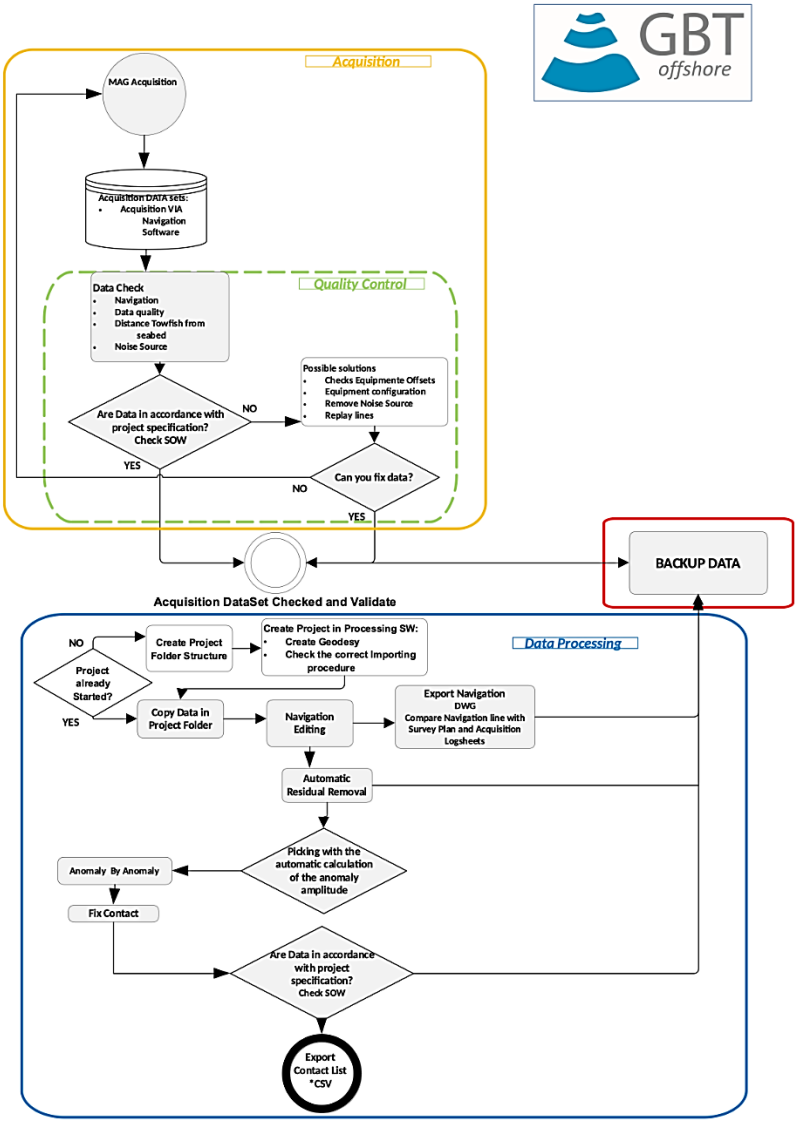


Figure 8.3: Magnetometer Processing Flow Chart

8.5 SUB-BOTTOM PROFILER AND SPARKER

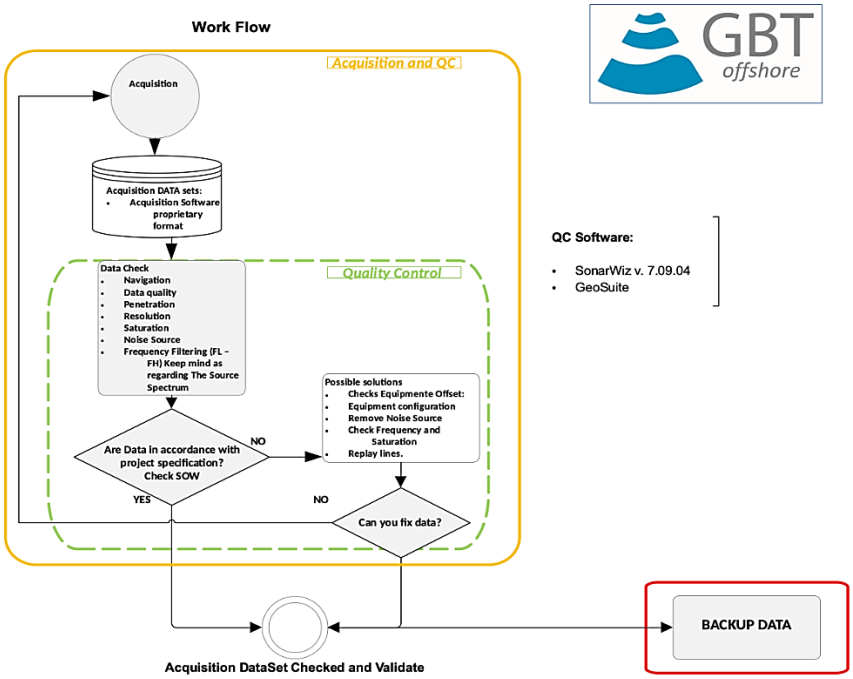


Figure 8.4: Sub Bottom Profiler and Sparker Processing Flow Chart

Seismic data were delivered as raw. GBT provided an accurate QC of records, but the processing has been finalized by CoNISMa (National Inter-University Consortium for Marine Sciences).

9. DELIVERABLES

In this chapter are listed the deliverables issued by GBT. It is important to highlight that GBT provided only processed (MBES), pre-processed (MAG, SPK, SSS) or raw data (SBP), not interpreted data.

All data were uploaded by GBT into a dedicated remote folder. The samplings were consigned to the CoNISMa representative.

9.1 MULTIBEAM

About the multibeam data, both ASCII files (XYZ) and GeoTIFF were delivered. The A, B, C, D1, and D2 areas have been issued with 5 m resolution, whereas 1m for D3 (nearshore). In Figures 9.1 and 9.2 are shown DTMs for sectors A and D3.

The nearshore sector shows slight waves (about 5 cm) connected with the bad weather during the acquisition time, but congruent with IHO special order.

All data are referred to the LAT.

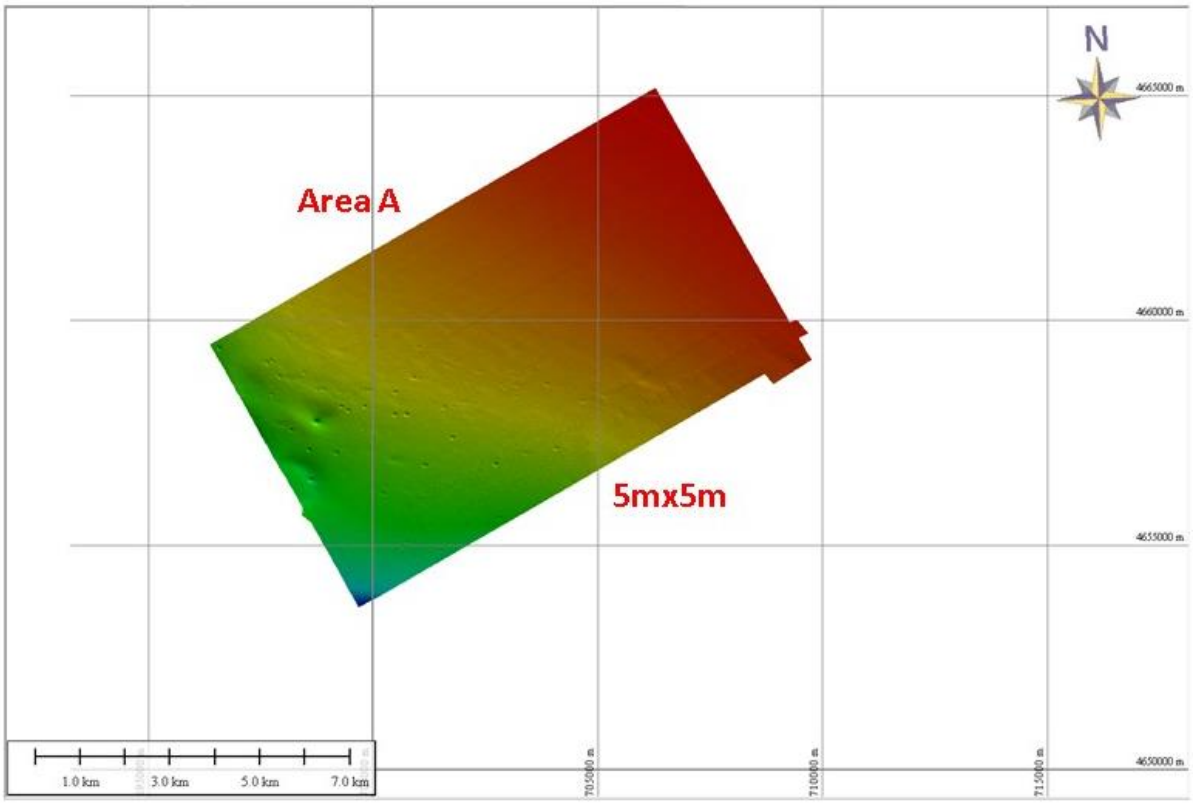


Figure 9.1: MBES overview: Area A (5x5m).

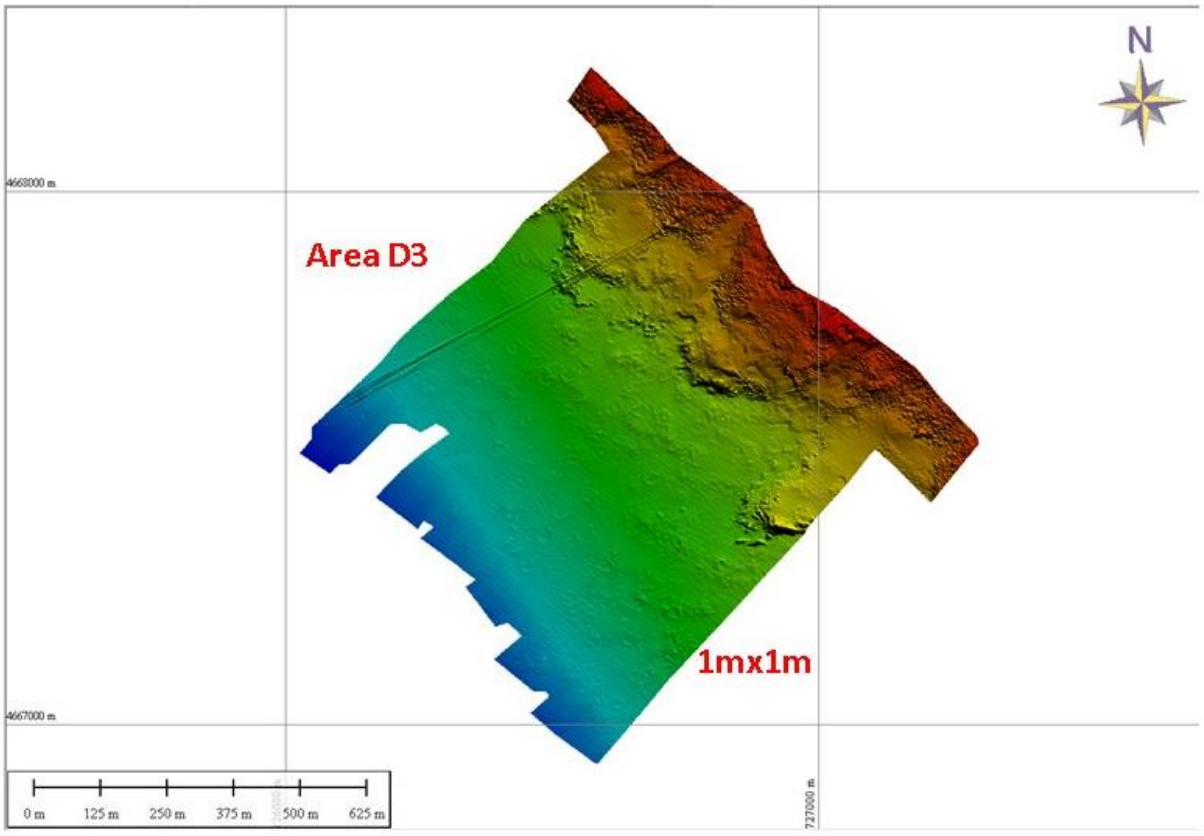


Figure 9.2: MBES overview: Area D3 (1x1m).

9.2 SIDE SCAN SONAR

Side Scan Sonar has been processed by SonarWiz (see also par. 8.1) and 5 high-frequency data projects and 5 low-frequency data projects have been built and delivered (Figures 9.3 and 9.4). The low-frequency projects include magnetometer data.

The areas in the projects were split as follows: A+C+D4 (depth sector), B, D1+D2, D3, and D4; each project includes all the XTF recorded, and only the low-frequency data have been used to build the mosaics. All data have been pre-processed and 5 m resolution mosaics were exported, with the exception of sector D3 (nearshore) where the collected data (range of 75 m per channel instead 300 m) allow to export 0.2 m resolution mosaic.

In addition to the mosaics (GeoTIFF format), pre-processed XTF (HF and LF) were exported and uploaded into the remote folder.

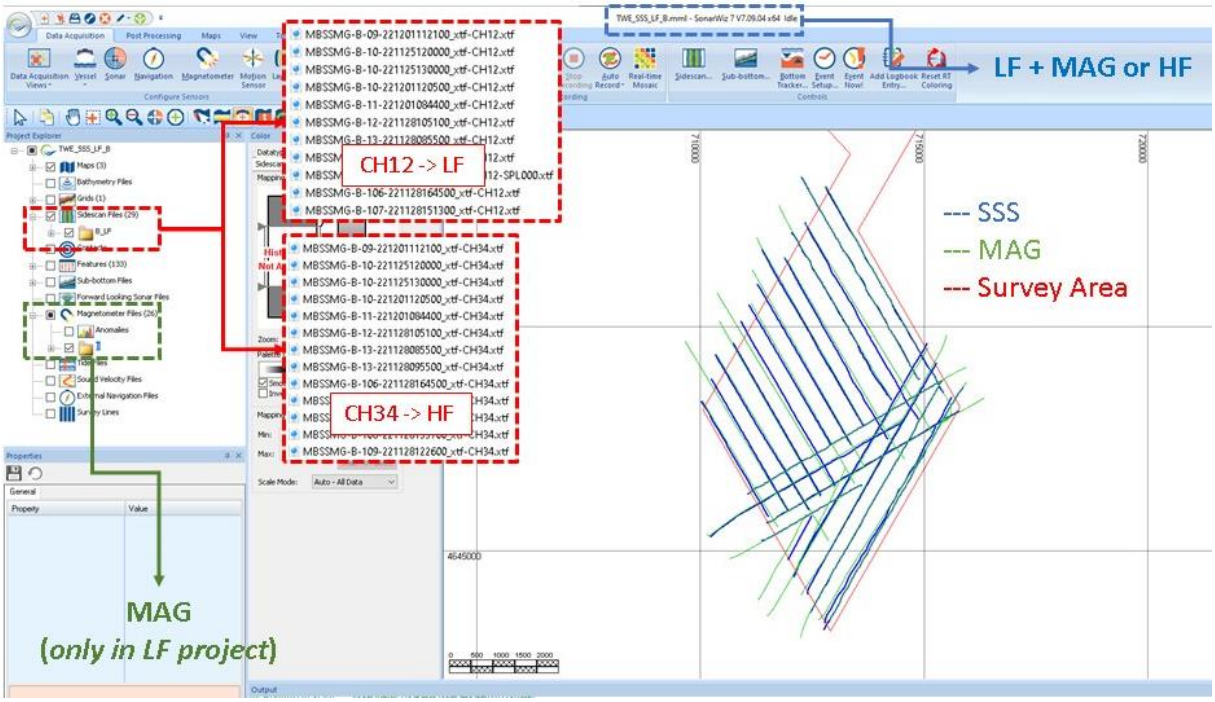


Figure 9.3: SonarWiz project for SSS.

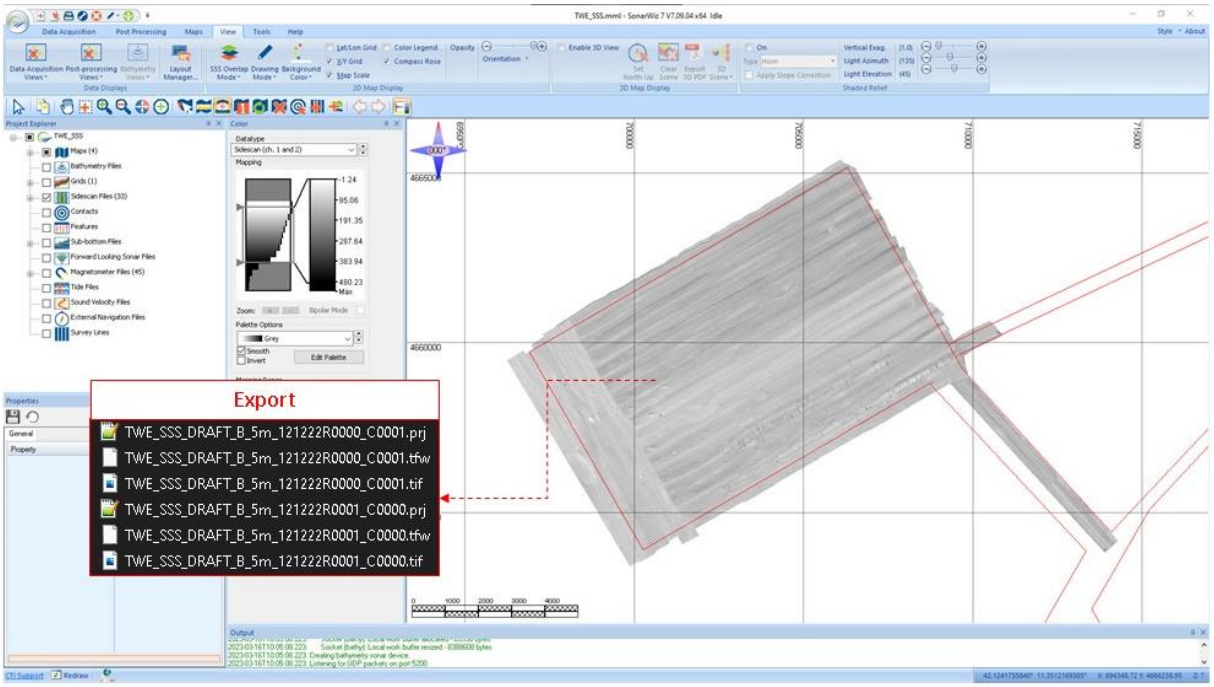


Figure 9.4: SonarWiz project for SSS.

To optimize the running of SonarWiz projects on different PCs, it is recommended to open the .mml file included in the project directory (Figure 9.5) with an ASCII reader and by the find&replace tool change the root from where the software will upload the project files.

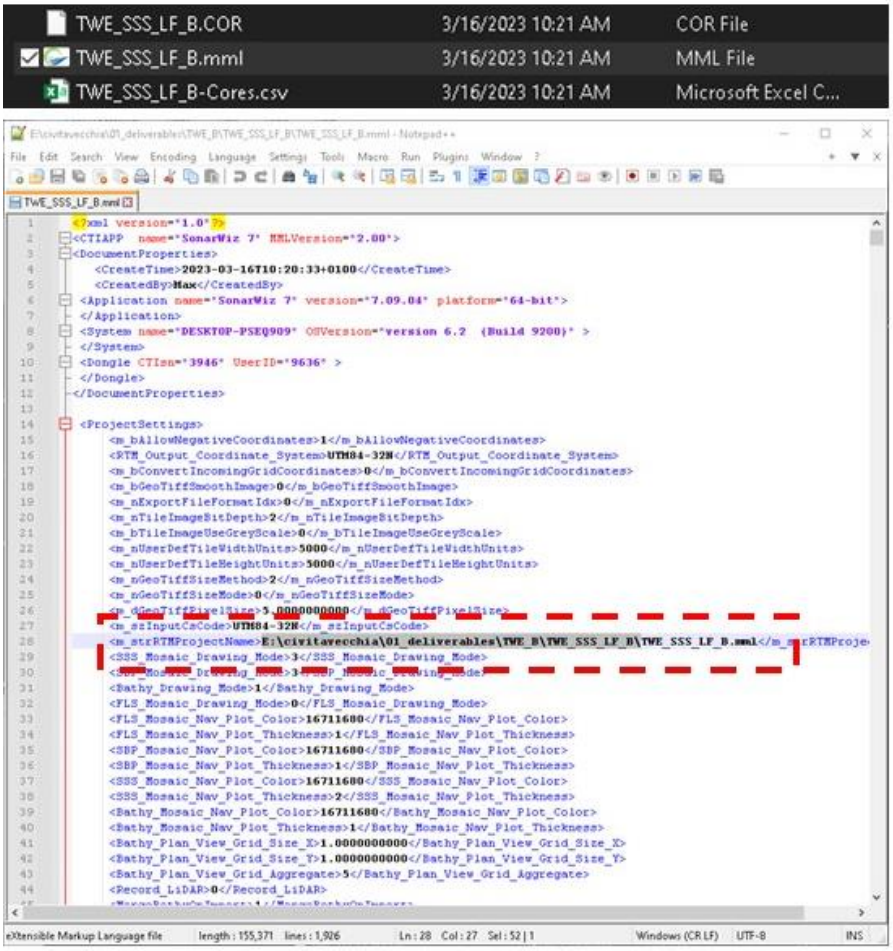


Figure 9.5: SonarWiz project setting.

Finally, about the HF dataset, it is important to highlight that lines result in a very limited range extension: because of the presence of strong noise and loosing of signal in the external part of the channels, during pre-processing the range was trimmed at about 100-130 m.

9.3 MAGNETOMETER

Magnetometer data have been pre-processed by SonarWiz (see also par. 8.1) and are available in the LF projects, as previously described.

In addition to the available data in the projects, an ASCII file for each record has been exported end uploaded to the remote folder (Figure 9.6); these files consist of X, Y, and gamma (nT) comma-separated text.

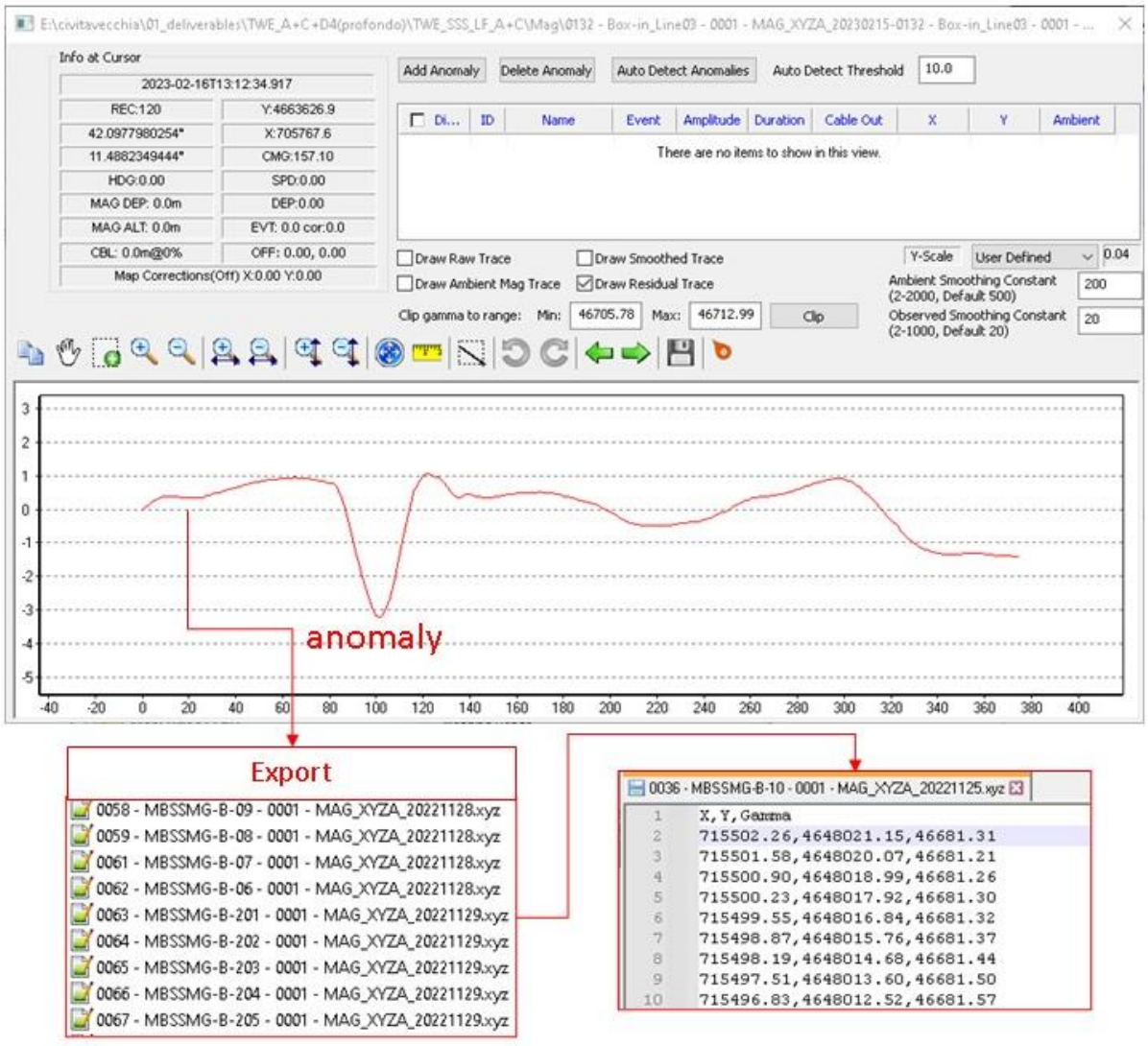


Figure 9.6: Magnetometer example and exporting.

9.4 SUB-BOTTOM PROFILER

Sub-bottom profiler lines have been recorded by SesWin (dedicated software by Innomar - see also par. 5.3) with .ses format. These data have been delivered as raw (Figure 9.7).

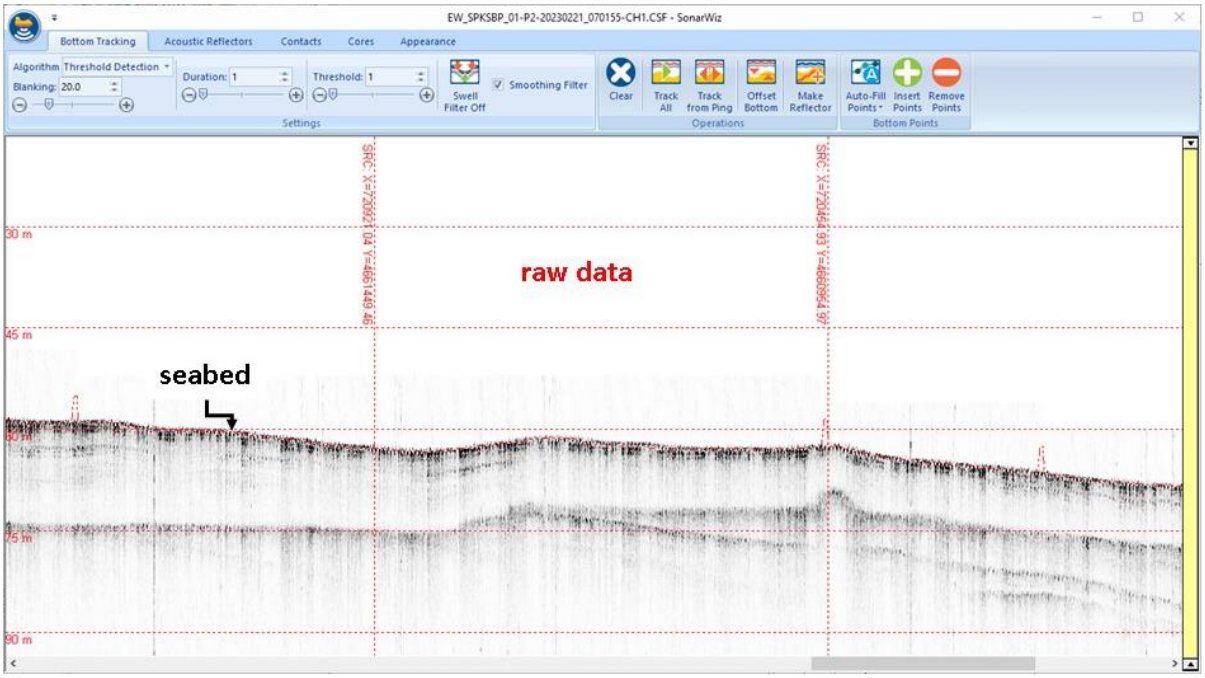


Figure 9.7: Sub-bottom example.

Innomar files (.ses) are not user-friendly and are not supported by Kingdom software (used by CoNISMa - Univeristy of Rome “La Sapienza”). For this reason, SGY files have been built by a dedicated tool in SonarWiz (Figure 9.8); the resulting file header (Figure 9.9) includes the coordinates at 73-76 and 77-80 positions (scalar 0.01, as indicated in position 71-72) and delay in position 109-110 (in msec).

Important note: the Kingdom-supported sub-bottom records have been delivered in 33 UTM-WGS84, as requested by the CoNISMa - University of Rome "La Sapienza", to merge and compare them with an existing dataset.

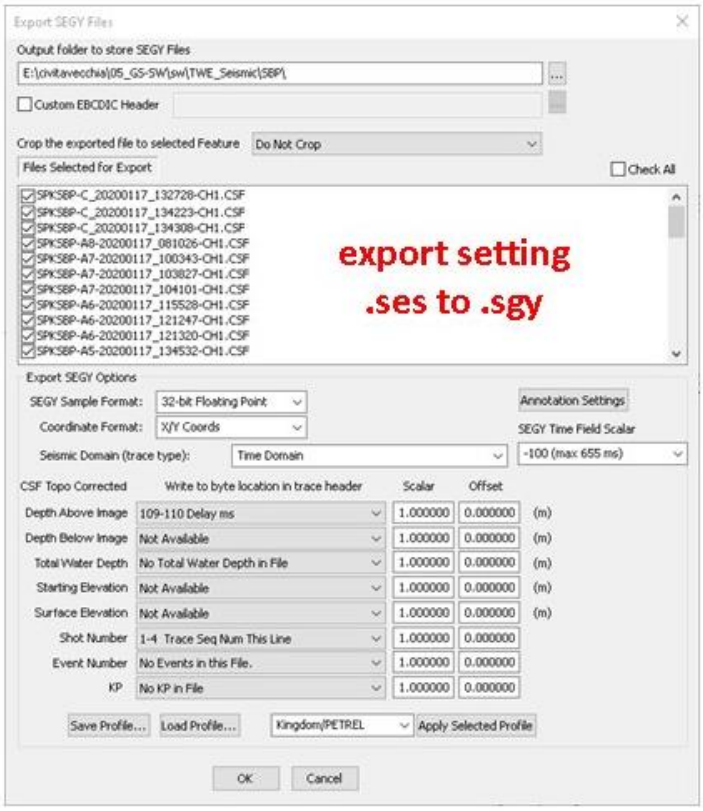


Figure 9.8: Sub-bottom profiler export setting from SonarWiz.

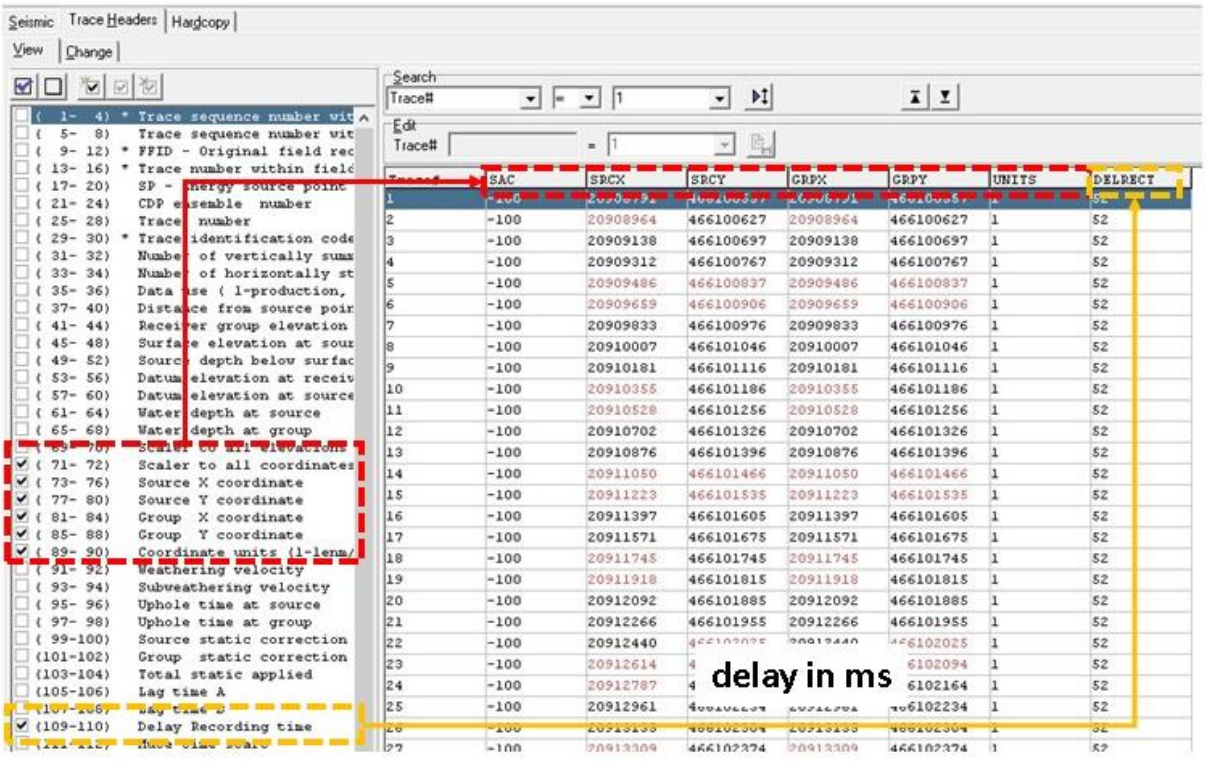


Figure 9.9: SGY setting.

9.5 SPARKER

Seismic profiles have been recorded in SGY format and delivered as raw. To perform the QC, all data have been imported into Geosuite-Allworks software, and a slight processing sequence has been applied (Figure 9.10). Geosuite projects were uploaded in the remote folder: one project for the Phase II dataset and one project for extra-work records.

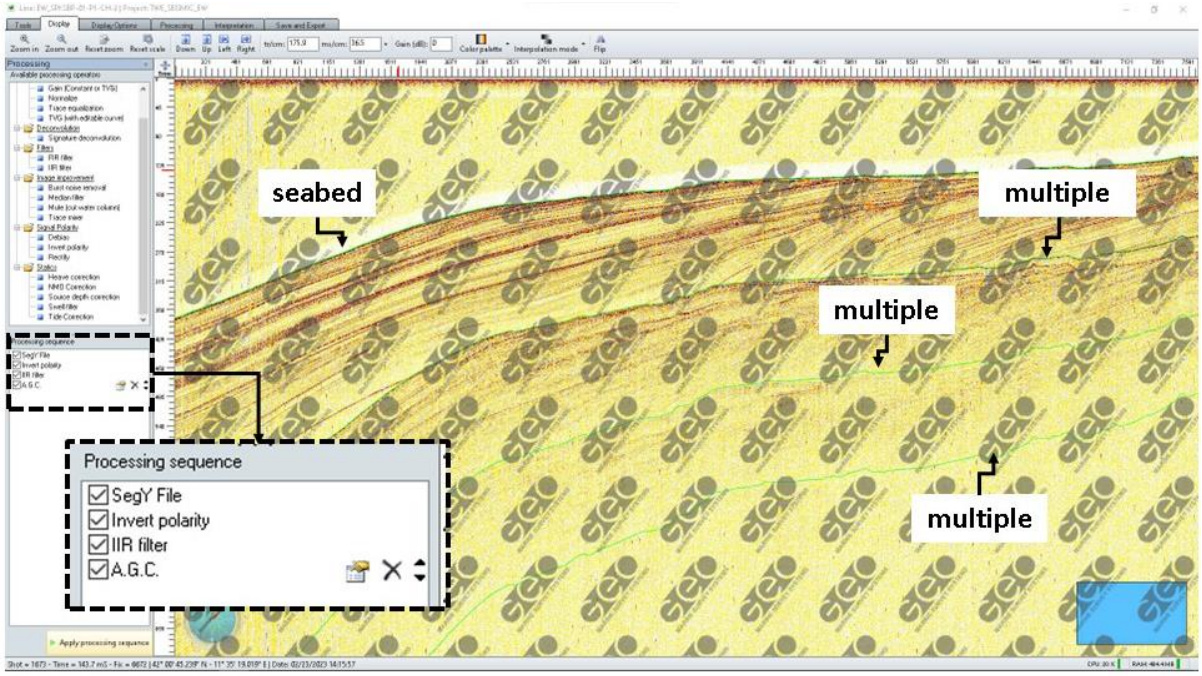


Figure 9.10: Sparker example.

9.6 SVP

All raw data have been uploaded to the remote folder as ASCII files (.vel format) and include two fields: depth (in m) and sound velocity in the water (in m/s). The positioning for each file is reported in the Online Logsheet (**Appendix A**).

9.7 VISUAL INSPECTION

Video inspection data has been delivered in MP4 format (HD and GoPro) and in WMV format (SD).

The SD videos are characterised by a 704x576 resolution (25 frame/second), the HD videos are characterised by a 1920x1080 resolution (60 frame/second), and finally GoPro records by a 1280x960 resolution (60 frame/second). The overlay data are present in SD and HD records.

An example for each format is reported in the images below.

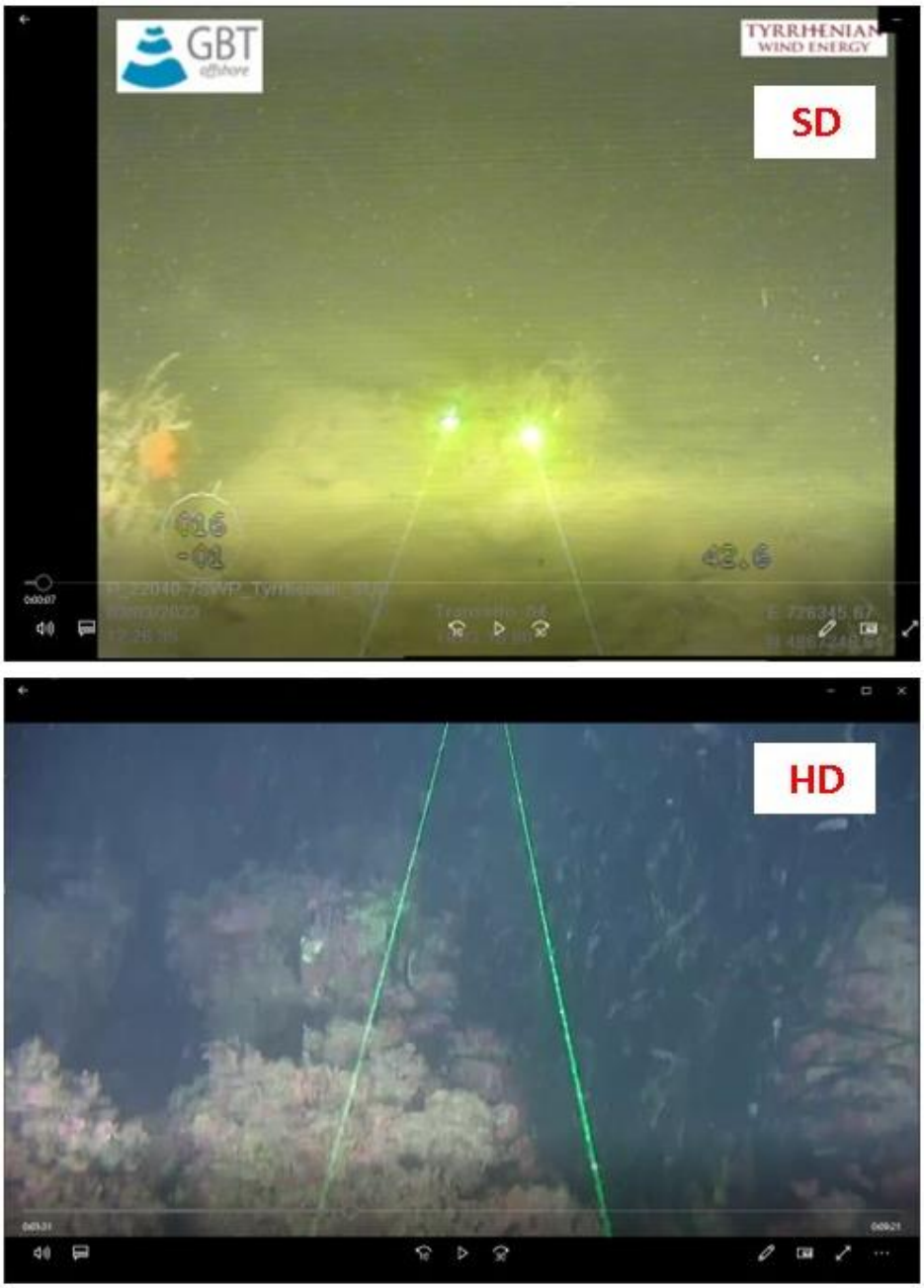


Figure 9.11: SD and HD video example.

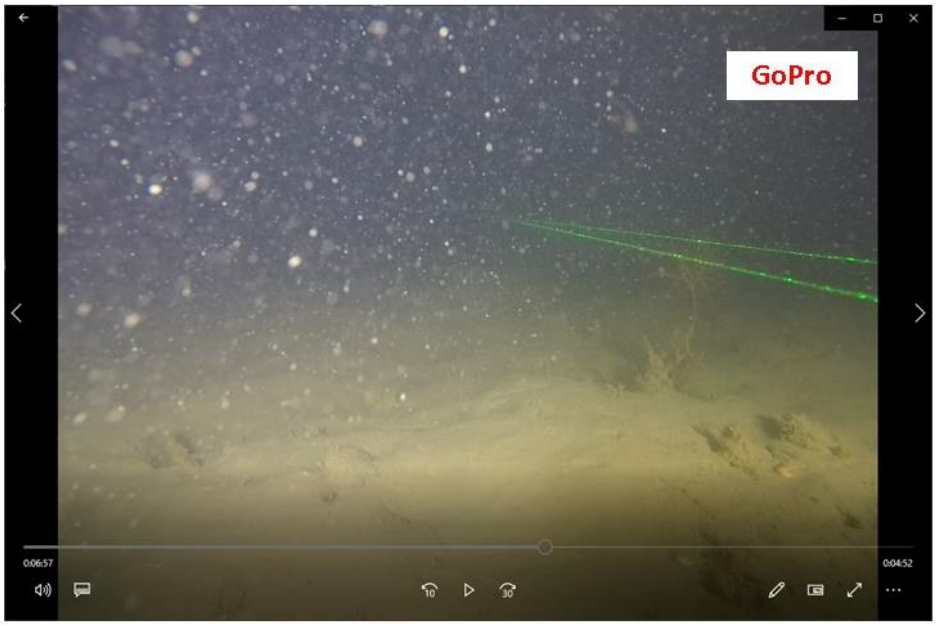


Figure 9.12: GoPro video example.

9.8 GRAB SAMPLING

The sampling activities and logistics have been managed by CoNISMa personnel. GBT provided to upload to the remote folder both a copy of digital images (Figures 9.13 and 9.14) and the as-built location exported from navigation software.

Figure 9.13: Grab example.

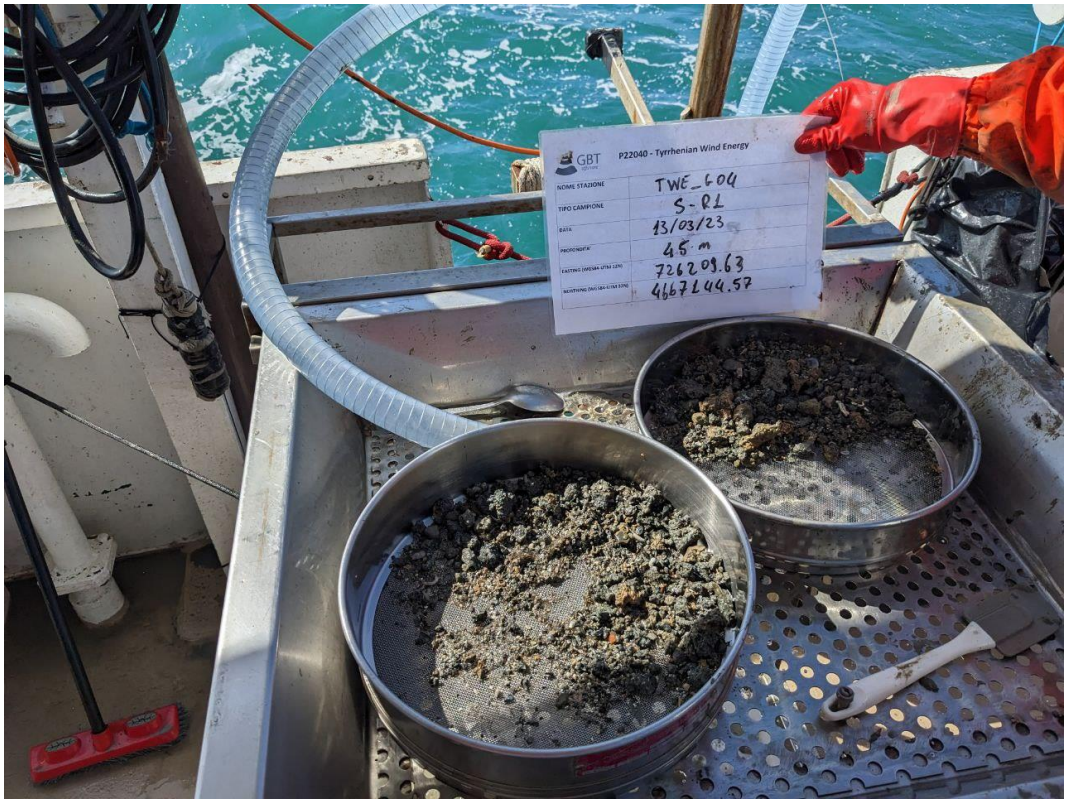


Figure 9.14: Sieve example.

9.9 TARGET INSPECTION

The following data have been delivered for this activity:

- very-high resolution side scan sonar mosaic and image (0.05 m), both LF and HF;
- magnetometer ASCII files (X, Y, gamma in nT);
- XTF files;
- Field report.

A data example is reported in Figure 9.15.

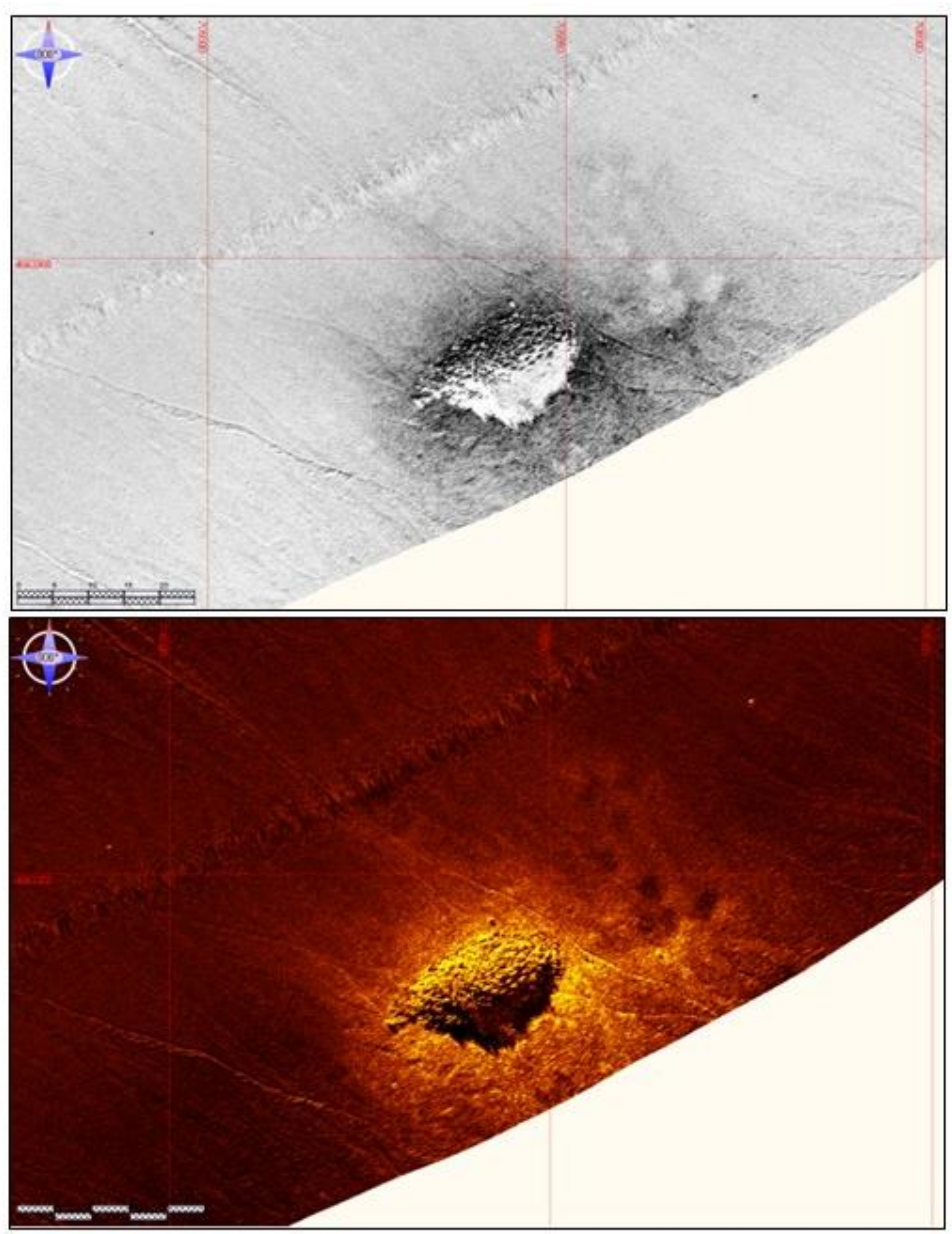


Figure 9.15: Very-high resolution SSS (target inspection – Area A).

Appendix A

Survey Log Sheet

Date	UTC Time	Status	Line Name	Storage .db	Easting Vessel	Northing Vessel	Lat Vessel	Lon Vessel	Easting SSS/SPK	Northing SSS/SPK	Lat SSS/SPK	Long SSS/SPK	Note
24/11/2022	13:23:38	USBL pole is lowered	CAL_03	0008 - CAL_03 - 0001.db	730298,36	4658913,91	42;02;54.77708N	11;46;58.04871E					
24/11/2022	13:54:16	Start GAMS	N-S_2	0010 - N-S_2 - 0001.db	729557,2	4658051,91	42;02;27.64075N	11;46;24.62945E					
24/11/2022	14:28:25	END GAMS	N-S_2	0010 - N-S_2 - 0001.db	729523,48	4658025,33	42;02;26.81533N	11;46;23.12706E					
24/11/2022	14:29:11	SVP	N-S_2	0010 - N-S_2 - 0001.db	729523,2	4658009,76	42;02;26.31149N	11;46;23.09290E					
24/11/2022	14:48:09	SOL	CAL_01	0010 - CAL_01 - 0001.db	729253,77	4658131,69	42;02;30.54313N	11;46;11.55886E					
24/11/2022	14:51:12	EOL	CAL_01	0011 - CAL_01 - 0001.db	729568,67	4658385,73	42;02;38.43973N	11;46;25.59844E					
24/11/2022	14:54:10	SOL	CAL_02	0011 - CAL_02 - 0001.db	729542,7	4658403,23	42;02;39.03383N	11;46;24.49455E					
24/11/2022	14:55:45	EOL Aborted	CAL_02	0012 - CAL_02 - 0001.db	729475,32	4658288,79	42;02;35.39830N	11;46;21.40570E					
24/11/2022	14:59:14	SOL	CAL_02	0012 - CAL_02 - 0001.db	729571,33	4658348,35	42;02;37.22643N	11;46;25.66140E					
24/11/2022	15:03:34	EOL	CAL_02	0013 - CAL_02 - 0001.db	729264,29	4658105,41	42;02;29.68086N	11;46;11.97918E					
24/11/2022	15:06:06	SOL	CAL_03	0013 - CAL_03 - 0001.db	729317,09	4658031,85	42;02;27.24319N	11;46;14.16956E					
24/11/2022	15:10:07	EOL	CAL_03	0014 - CAL_03 - 0001.db	729637,11	4658281,57	42;02;34.99430N	11;46;28.42519E					
24/11/2022	15:11:22	SOL	CAL_04	0014 - CAL_04 - 0001.db	729699,91	4658224,72	42;02;33.08723N	11;46;31.07315E					
24/11/2022	15:12:06	EOL	CAL_04	0015 - CAL_04 - 0001.db	729753,04	4658163,58	42;02;31.05146N	11;46;33.29538E					
25/11/2022	06:31:58	Start transit to USBL Calibration Area	CAL_04	0021 - CAL_04 - 0001.db	731886,39	4660624,09	42;03;48.48102N	11;48;09.48558E					
25/11/2022	06:55:49	Vessel Arrived to USBL Calibration Area	CAL_04	0021 - CAL_04 - 0001.db	729719,85	4658644,66	42;02;46.66640N	11;46;32.53212E					
25/11/2022	06:56:37	SVP	CAL_04	0021 - CAL_04 - 0001.db	729714,19	4658649,29	42;02;46.82230N	11;46;32.29250E					
25/11/2022	07:31:10	Start USBL Calibration	E-W_1	0022 - E-W_1 - 0001.db	729531,85	4658756,62	42;02;50.48972N	11;46;24.52141E	729682,88	4658683,82	42;02;47.97342N	11;46;30.98094E	
25/11/2022	07:34:29	SOL	E-W_1	0022 - E-W_1 - 0001.db	729454,2	4658732,22	42;02;49.78129N	11;46;21.11288E					
25/11/2022	07:38:28	EOL	E-W_1	0023 - E-W_1 - 0001.db	729858,15	4658771,15	42;02;50.61724N	11;46;38.71975E	729682,97	4658678,85	42;02;47.81241N	11;46;30.97793E	
25/11/2022	07:45:07	SOL	E-W_2	0024 - E-W_2 - 0001.db	729869,73	4658658,04	42;02;46.94190N	11;46;39.06309E	729674,28	4658682,18	42;02;47.92934N	11;46;30.60490E	
25/11/2022	07:48:09	EOL	E-W_2	0024 - E-W_2 - 0001.db	729553,42	4658653,32	42;02;47.12163N	11;46;25.31298E	729675,54	4658683,51	42;02;47.97119N	11;46;30.66169E	
25/11/2022	07:51:32	SOL	D_2	0025 - D_2 - 0001.db	729519,68	4658716,14	42;02;49.19159N	11;46;23.93574E	729686,48	4658686,42	42;02;48.05393N	11;46;31.14097E	
25/11/2022	07:54:03	EOL	D_2	0026 - D_2 - 0001.db	729732,61	4658579,7	42;02;44.54931N	11;46;32.99494E	729679,11	4658683,42	42;02;47.96455N	11;46;30.81650E	
25/11/2022	07:56:24	SOL	D_1	0026 - D_1 - 0001.db	729862,58	4658648,63	42;02;46.64483N	11;46;38.73919E	729670,02	4658679,83	42;02;47.85777N	11;46;30.41672E	
25/11/2022	07:59:13	EOL	D_1	0027 - D_1 - 0001.db	729605,53	4658822,87	42;02;52.55794N	11;46;27.81644E	729676,88	4658678,47	42;02;47.80661N	11;46;30.71288E	
25/11/2022	08:03:24	SOL	N-S_1	0027 - N-S_1 - 0001.db	729691,92	4658895,03	42;02;54.80399N	11;46;31.67183E	729679,88	4658678,9	42;02;47.81741N	11;46;30.84355E	
25/11/2022	08:06:24	EOL	N-S_1	0028 - N-S_1 - 0001.db	729552,1	4658627,37	42;02;46.28284N	11;46;25.21883E	729676,31	4658683,22	42;02;47.96105N	11;46;30.69481E	
25/11/2022	08:09:25	SOL	N-S_2	0028 - N-S_2 - 0001.db	729647,26	4658558,92	42;02;43.96584N	11;46;29.25724E	729676,75	4658690,05	42;02;48.18173N	11;46;30.72342E	
25/11/2022	08:11:47	EOL	N-S_2	0028 - N-S_2 - 0001.db	729764,03	4658767,74	42;02;50.60577N	11;46;34.62538E	729679,38	4658683,55	42;02;47.96834N	11;46;30.82855E	
25/11/2022	08:13:25	SOL	N-S_2	0029 - N-S_2 - 0001.db	729814,21	4658818,52	42;02;52.19759N	11;46;36.87736E	729675,00	4658675,52	42;02;47.71297N	11;46;30.62687E	
25/11/2022	08:16:26	EOL	N-S_2	0030 - N-S_2 - 0001.db	729656,9	4658574,12	42;02;44.44812N	11;46;29.69722E	729680,04	4658683,11	42;02;47.95333N	11;46;30.85669E	
25/11/2022	08:21:00	SOL	E-W_2	0030 - E-W_2 - 0001.db	729555,89	4658617,39	42;02;45.95565N	11;46;25.36973E	729678,14	4658684,61	42;02;48.00393N	11;46;30.77608E	
25/11/2022	08:23:30	EOL	E-W_2	0031 - E-W_2 - 0001.db	729779,4	4658666,18	42;02;47.30064N	11;46;35.14970E	729677,10	4658682,28	42;02;47.92974N	11;46;30.72770E	
25/11/2022	08:25:44	SOL	D_2	0031 - D_2 - 0001.db	729757,58	4658568,86	42;02;44.17181N	11;46;34.06443E	729672,91	4658686,24	42;02;48.06219N	11;46;30.55107E	
25/11/2022	08:28:10	EOL	D_2	0032 - D_2 - 0001.db	729547,87	4658735,36	42;02;49.78463N	11;46;25.18750E	729678,80	4658688,57	42;02;48.13159N	11;46;30.81034E	
25/11/2022	08:35:33	SOL	N-S_1	0032 - N-S_1 - 0001.db	729597,35	4658714,58	42;02;49.05970N	11;46;27.30801E	729682,11	4658683,96	42;02;47.97894N	11;46;30.94763E	
25/11/2022	08:36:55	EOL	N-S_1	0033 - N-S_1 - 0001.db	729666,98	4658829,54	42;02;52.70928N	11;46;30.49573E	729682,41	4658681,68	42;02;47.90455N	11;46;30.95753E	
25/11/2022	08:41:48	SOL	D_1	0033 - D_1 - 0001.db	729539,16	4658860,65	42;02;53.85112N	11;46;24.98567E	729676,85	4658680,64	42;02;47.87677N	11;46;30.71463E	
25/11/2022	08:45:42	EOL	D_1	0034 - D_1 - 0001.db	729789,4	4658655,41	42;02;46.94125N	11;46;35.56909E	729676,97	4658682,14	42;02;47.92514N	11;46;30.72173E	
25/11/2022	08:49:04	SOL	E-W_1	0034 - E-W_1 - 0001.db	729806,64	4658783,19	42;02;51.06136N	11;46;36.49867E	729676,11	4658680,53	42;02;47.87394N	11;46;30.68230E	
25/11/2022	08:51:45	EOL	E-W_1	0035 - E-W_1 - 0001.db	729555,31	4658754,73	42;02;50.40401N	11;46;25.53807E	729679,63	4658684,39	42;02;47.99547N	11;46;30.84045E	
25/11/2022	08:53:38	SOL	Spin Check	0035 - Spin Check - 0001.db	729572,08	4658652,7	42;02;47.08220N	11;46;26.12275E	729681,68	4658689,44	42;02;48.15671N	11;46;30.93683E	
25/11/2022	08:55:55	EOL	Spin Check	0036 - Spin Check - 0001.db	729473,58	4658691,12	42;02;48.42981N	11;46;21.89722E	729667,27	4658697,08	42;02;48.41938N	11;46;30.32129E	
25/11/2022	09:21:13	End USBL Calibration OPS	Spin Check	0036 - Spin Check - 0001.db	729428,21	4658781,09	42;02;51.39119N	11;46;20.05269E					
25/11/2022	09:28:39	USBL pole is elevated	Spin Check	0036 - Spin Check - 0001.db									
25/11/2022	09:35:21	Start trasnsit to survey area	Spin Check	0036 - Spin Check - 0001.db	729424,64	4658782,13	42;02;51.42871N	11;46;19.89895E					
25/11/2022	10:38:55	USBL pole is lowered		0036 - Spin Check - 0001.db									
25/11/2022	11:49:30	SOL	MBSSMG-B-10	0036 - MBSSMG-B-10 - 0001.db	715635,47	4648508,17	41;57;32.69949N	11;36;07.11489E	715504,83	4648011,52	41;57;16.74092N	11;36;00.79140E	
25/11/2022	12:50:38	EOL	MBSSMG-B-10	0037 - MBSSMG-B-10 - 0001.db	712712,78	4643354,21	41;54;48.61022N	11;33;53.58226E	713198,77	4644356,15	41;55;20.59319N	11;34;15.96128E	
25/11/2022	12:50:43	SOL	MBSSMG-B-10	0037 - MBSSMG-B-10 - 0001.db	712708,34	4643346,44	41;54;48.36304N	11;33;53.37970E	713201,08	4644364,21	41;55;20.85222N	11;34;16.07205E	
25/11/2022	13:03:58	EOL	MBSSMG-B-10	0037 - MBSSMG-B-10 - 0001.db	712190,76	4642279,42	41;54;14.30101N	11;33;29.55306E	712473,17	4641268,16	41;53;41.27106N	11;33;40.48857E	
25/11/2022	13:38:31	SOL	MBSSMG-B-08	0038 - MBSSMG-B-08 - 0001.db	712101,37	4644415,44	41;55;23.57745N	11;33;28.44101E					
25/11/2022	14:42:34	EOL	MBSSMG-B-08	0039 - MBSSMG-B-08 - 0001.db	715506,16	4650207,18	41;58;27.85857N	11;36;03.74293E	715112,07	4649556,9	41;58;07.18308N	11;35;45.78118E	
25/11/2022	15:03:13	SSS is on deck	MBSSMG-B-08	0039 - MBSSMG-B-08 - 0001.db	715806,13	4651734,59	41;59;17.03704N	11;36;18.78170E					
25/11/2022	15:03:34	SVP	MBSSMG-B-08	0039 - MBSSMG-B-08 - 0001.db	715800,57	4651749,02	41;59;17.50983N	11;36;18.55918E					
25/11/2022	15:39:02	USBL pole is elevated	MBSSMG-B-08	0039 - MBSSMG-B-08 - 0001.db	715795,78	4651767,52	41;59;18.11381N	11;36;18.37590E					
25/11/2022	15:40:22	Vessel Moored											
26/11/22	09:10:23	Start transit to survey area D3											
26/11/2022	10:10:54	USBL pole is lowered	MBSSMG-D3-L06	0039 - MBSSMG-D3-L06 - 0001.db	726523,74	4668431,28	42;08;06.95716N	11;44;27.30604E					
26/11/2022	10:22:31	SVP	MBSSMG-D3-L06	0039 - MBSSMG-D3-L06 - 0001.db	726116,48	4667662,74	42;07;42.49023N	11;44;08.51367E					
26/11/22	10:36:04	SSS is in the water	MBSSMG-D3-L04	0039 - MBSSMG-D3-L04 - 0001.db	725707,67	4667825,17	42;07;48.17464N	11;43;50.95368E	725713,97	4667816,22	42;07;47.87838N	11;43;51.21540E	
26/11/2022	10:51:20	SOL	MBSSMG-D3-R06	0039 - MBSSMG-D3-R06 - 0001.db	726057,08	4667490,99	42;07;36.98948N	11;44;05.68995E	726033,91	4667459,07	42;07;35.97999N	11;44;04.63727E	
26/11/2022	11:02:26	EOL	MBSSMG-D3-R06	0040 - MBSSMG-D3-R06 - 0001.db	726697,27	4668220,57	42;07;59.95257N	11;44;34.56196E					
26/11/2022	11:07:02	SOL	MBSSMG-D3-R05	0040 - MBSSMG-D3-R05 - 0001.db	726720,47	4668113,43	42;07;56.45833N	11;44;35.42177E					
26/11/2022	11:13:27	EOL	MBSSMG-D3-R05	0041 - MBSSMG-D3-R05 - 0001.db	726221,1	4667564,9	42;07;39.21302N	11;44;12.92874E	726257,94	4667622,23	42;07;41.03143N	11;44;14.61171E	
26/11/2022	11:16:47	SOL	MBSSMG-D3-R04	0041 - MBSSMG-D3-R04 - 0001.db	726281,53	4667565,86	42;07;39.18127N	11;44;15.55920E	726266,61	4667539,06	42;07;38.32871N	11;44;14.87257E	
26/11/2022	11:24:06	EOL	MBSSMG-D3-R04	0042 - MBSSMG-D3-R04 - 0001.db	726767,4	4668056,59	42;07;54.56866N	11;44;37.38397E	726765,69	4668057,16	42;07;54.58917N	11;44;37.31054E	
26/11/2022	11:27:31	SOL	MBSSMG-D3-R02	0042 - MBSSMG-D3-R02 - 0001.db	726869,19	4668006,11	42;07;52.82813N	11;44;41.74191E	726870,58	4668017,08	42;07;53.18178N	11;44;41.81783E	
26/11/2022	11:35:14	EOL	MBSSMG-D3-R02	0043 - MBSSMG-D3-R02 - 0001.db	726257,97	4667373,67	42;07;32.98130N	11;44;14.26618E	726296,61	4667427,08	42;07;34.67089N	11;44;16.02189E	
26/11/2022	11:41:26	SOL	MBSSMG-D3-R03	0043 - MBSSMG-D3-R03 - 0001.db	726211,49	4667398,24	42;07;33.82536N	11;44;12.27831E	726175,67	4667361,41	42;07;32.66986N	11;44;10.66850E	
26/11/2022	11:50:29	EOL	MBSSMG-D3-R03	0044 - MBSSMG-D3-R03 - 0001.db	726808,41	4668036,31	42;07;53.86930N	11;44;39.13986E	726801,99	4668030,3	42;07;53.68142N	11;44;38.85209E	
26/11/2022	11:55:25	SOL	MBSSMG-D3-R01	0044 - MBSSMG-D3-R01 - 0001.db	726883,43	4667939,88	42;07;50.66807N	11;44;42.26911E	726890,97	4667943,98	42;07;50.79309N	11;44;42.60297E	
26/11/2022	12:02:54	EOL	MBSSMG-D3-R01	0045 - MBSSMG-D3-R01 - 0001.db	726287,05	4667317,09	42;07;31.11899N	11;44;15.45228E	726329,37	4667376,85	42;07;33.01022N	11;44;17.37693E	
26/11/2022	12:05:57	SOL	MBSSMG-D3-CL	0045 - MBSSMG-D3-CL - 0001.db	726356,36	4667269,87	42;07;29.51754N	11;44;18.40152E	726326,55	4667247,88	42;07;28.83630N	11;44;17.07405E	
26/11/2022	12:14:45	EOL	MBSSMG-D3-CL	0046 - MBSSMG-D3-CL - 0001.db	726911,75	4667873,84	42;07;48.49997N	11;44;43.40892E	726912,35	4667876,08	42;07;48.57197N	11;44;43.43783E	
26/11/2022	12:18:00	SOL	MBSSMG-D3-L02	0046 - MBSSMG-D3-L02 - 0001.db	727028,7	4667813,35	42;07;46.41913N	11;44;48.41232E	727035,20	4667818,65	42;07;46.58402N	11;44;48.70239E	
26/11/2022	12:25:42	EOL	MBSSMG-D3-L02	0047 - MBSSMG-D3-L02 - 0001.db	726407,37	4667184,02	42;07;26.68404N	11;44;20.50109E	726444,16	4667231,6	42;07;28.18698N	11;44;22.16783E	
26/11/2022	12:28:33	SOL	MBSSMG-D3-L01	0047 - MBSSMG-D3-L01 - 0001.db	726367,72	4667222,24	42;07;27.96305N	11;44;18.82949E	726340,31	4667206,22	42;07;27.47283N	11;44;17.61476E	
26/11/2022	12:37:33	EOL	MBSSMG-D3-L01	0048 - MBSSMG-D3-L01 - 0001.db	726948,81	4667810,77	42;07;46.41877N	11;44;44.93296E	726949,76	4667813,78	42;07;46.51519N	11;44;44.97844E	
26/11/2022	12:40:58	SOL	MBSSMG-D3-L03	0048 - MBSSMG-D3-L03 - 0001.db	727050,03	4667761,1	42;07;44.70454N	11;44;49.26725E	727059,10	4667764,08	42;07;44.79165N	11;44;49.66584E	
26/11/2022	12:48:54	EOL	MBSSMG-D3-L03	0049 - MBSSMG-D3-L03 - 0001.db	726426,85	4667090,14	42;07;23.62365N	11;44;21.21722E	726467,63	4667141,91	42;07;25.25784N	11;44;23.06367E	
26/11/2022	12:51:29	SOL	MBSSMG-D3-L04	0049 - MBSSMG-D3-L04 - 0001.db	726492,83	4667057,16	42;07;22.48675N	11;44;24.04157E	726463,13	4667029,79	42;07;21.63123N	11;44;22.71148E	
26/11/2022	13:01:51	EOL	MBSSMG-D3-L04	0050 - MBSSMG-D3-L04 - 0001.db	727094,13	4667698,44	42;07;42.62947N	11;44;51.09798E	727089,61	4667702,25	42;07;42.75756N	11;44;50.90656E	
26/11/2022	13:06:30	SOL	MBSSMG-D3-L06	0050 - MBSSMG-D3-L06 - 0001.db	727172,35	4667625,44	42;07;40.18356N	11;44;54.39880E					
26/11/2022	13:14:17	EOL	MBSSMG-D3-L06	0051 - MBSSMG-D3-L06 - 0001.db	726539,76	4666946,8	42;07;18.86376N	11;44;25.92935E	726575,55	4666999,93	42;07;20.54733N	11;44;27.56028E	
26/11/2022	13:17:01	SOL	MBSSMG-D3-L05	0051 - MBSSMG-D3-L05 - 0001.db	726497,11	4666991,22	42;07;20.34697N	11;44;24.13586E	726473,64	4666968,04	42;07;19.62058N	11;44;23.08255E	
26/11/2022	13:27:48	EOL	MBSSMG-D3-L05	0052 - MBSSMG-D3-L05 - 0001.db	727131,08	4667666,39	42;07;41.55274N	11;44;52.66083E	727125,09	4667657,62	42;07;41.27507N	11;44;52.38787E	
26/11/2022	13:32:06	SOL	MBSSMG-D4-1	0052 - MBSSMG-Infill - 0001	726900,05	4667880,72	42;07;48.73508N	11;44;42.90951E					
26/11/2022	13:32:38	EOL	MBSSMG-D4-1	0052 - MBSSMG-Infill - 0001	726854,45	4667903,97	42;07;49.53531N	11;44;40.95800E					
26/11/2022	13:39:31	SOL	MBSSMG-D4-1	0053 - MBSSMG-D4-1 - 0001.db	726594,78	4667923,24	42;07;50.42975N	11;44;29.68698E	726610,51	4667925,39	42;07;50.48290N	11;44;30.37461E	
26/11/2022	14:06:19	EOL	MBSSMG-D4-1	0054 - MBSSMG-D4-1 - 0001.db	724351,13	4666861,37	42;07;18.36176N	11;42;50.59889E	724409,18	4666905,56	42;07;19.73338N	11;42;53.18560E	
26/11/2022	14:23:13	SOL	MBSSMG-D2-1	0054 - MBSSMG-D2-1 - 0001.db	725295,25	4666162,93	42;06;54.76751N	11;43;30.70115E	725234,58	4666159,95	42;06;54.73381N	11;43;28.05776E	
26/11/2022	14:42:17	EOL	MBSSMG-D2-1	0055 - MBSSMG-D2-1 - 0001.db	726678,76	4667615,02	42;07;40.36026N	11;44;32.90993E	726667,50	4667602,45	42;07;39.96515N	11;44;32.40253E	
26/11/2022	14:47:28	SSS is on deck											
26/11/2022	14:51:58	SVP											
26/11/2022	14:52:00	USBL pole is elevated											
26/11/2022	14:56:05	Start transit to Riva di Traiano Port											
26/11/2022	15:58:03	Vessel moored at Riva di Traiano Port											
28/11/2022	05:45:00	Start transit to survey area B											
28/11/2022	06:30:00	SVP											
28/11/2022	06:40:00	SOL	CAL_01	0056 - CAL_01 - 0001.db	729253,77	4658131,69	42;02;30.54313N	11;46;11.55886E					
28/11/2022	06:44:00	EOL	CAL_01		729568,67	4658385,73	42;02;38.43973N	11;46;25.59844E					

28/11/2022	06:45:00	SOL	CAL_02	0057 - CAL_02 - 0001.db	729571,33	4658348,35	42;02;37.22643N	11;46;25.66140E					
28/11/2022	06:49:00	EOL	CAL_02		729264,29	4658105,41	42;02;29.68086N	11;46;11.97918E					
28/11/2022	06:50:00	SOL	CAL_03	0058 - CAL_03 - 0001.db	729317,09	4658031,85	42;02;27.24319N	11;46;14.16956E					
28/11/2022	06:53:00	EOL	CAL_03		729637,11	4658281,57	42;02;34.99430N	11;46;28.42519E					
28/11/2022	08:52:35	SOL NO CAL	MBSSMG-B-13	0056 - MBSSMG-B-13 - 0001.db	715703,35	4648220,05	41;57;23.30023N	11;36;09.68063E	715938,10	4648753,55	41;57;40.34920N	11;36;20.57178E	
28/11/2022	10:00:31	EOL	MBSSMG-B-13	0057 - MBSSMG-B-13 - 0001.db	712216,64	4642182,87	41;54;11.14832N	11;33;30.54991E	712823,63	4643381,85	41;54;49.39800N	11;33;58.42540E	
28/11/2022	10:37:33	SOL NO CAL	MBSSMG-B-12	0057 - MBSSMG-B-12 - 0001.db	712577,79	4643616,11	41;54;57.22472N	11;33;48.06779E	712246,46	4643054,13	41;54;39.34150N	11;33;32.97101E	
28/11/2022	11:54:56	EOL	MBSSMG-B-12	0058 - MBSSMG-B-12 - 0001.db	715910,02	4649435,31	41;58;02.45971N	11;36;20.25363E					
28/11/2022	12:16:24	SOL NO CAL	MBSSMG-B-09	0058 - MBSSMG-B-109 - 0001.db	715564,82	4648793,98	41;57;42.02629N	11;36;04.42588E	715915,81	4649090,6	41;57;51.28864N	11;36;20.04973E	
28/11/2022	13:12:23	EOL	MBSSMG-B-09	0059 - MBSSMG-B-109 - 0001.db	710033,98	4645662,16	41;56;05.95124N	11;32;00.36859E	711049,31	4646279,07	41;56;24.95939N	11;32;45.21093E	
28/11/2022	13:55:36	SOL	MBSSMG-B-08	0059 - MBSSMG-B-108 - 0001.db	711241,89	4645892,45	41;56;12.25048N	11;32;53.06698E	710147,46	4645385,8	41;55;56.89038N	11;32;04.93674E	
28/11/2022	14:39:53	EOL	MBSSMG-B-08	0060 - MBSSMG-B-108 - 0001.db	715521,1	4648318,19	41;57;26.65830N	11;36;01.90139E	714544,83	4647947,46	41;57;15.60784N	11;35;19.04930E	
28/11/2022	15:06:15	SOL	MBSSMG-B-07	0061 - MBSSMG-B-107 - 0001.db	715635,89	4647937,74	41;57;14.22235N	11;36;06.38102E	716321,92	4648402,45	41;57;28.59824N	11;36;36.76446E	
28/11/2022	15:58:19	EOL	MBSSMG-B-07	0062 - MBSSMG-B-107 - 0001.db	710402,85	4644980,74	41;55;43.52468N	11;32;15.49518E	711466,44	4645617,22	41;56;03.11879N	11;33;02.45334E	
28/11/2022	16:35:02	SOL	MBSSMG-B-06	0062 - MBSSMG-B-106 - 0001.db	711642,59	4645200,18	41;55;49.43995N	11;33;09.55559E	710659,78	4644831,59	41;55;38.44674N	11;32;26.44837E	
28/11/2022	17:06:58	EOL											
28/11/2022	17:08:44	SSS is on deck											
29/11/22	17:08:44	USBL pole is elevated											
28/11/2023	06:34:00	Vessel start transit to survey area B											
29/11/2022	08:26:26	Vessel arrived to survey Area B			713574,6	4649914,94	41;58;20.28517N	11;34;39.51749E					
29/11/2022	08:26:29	USBL pole is lowered			713577,37	4649913,25	41;58;20.22771N	11;34;39.63540E					
29/11/2022	08:26:32	SVP	MBSSMG-B-06	0063 - MBSSMG-B-06 - 0001.db	713579,86	4649912,11	41;58;20.18837N	11;34;39.74191E					
29/11/2022	08:27:03	SSS is in the water	MBSSMG-B-06	0063 - MBSSMG-B-06 - 0001.db	713603,64	4649898,81	41;58;19.73414N	11;34;40.75687E					
29/11/2022	09:10:08	SOL	MBSSMG-B-201	0063 - MBSSMG-B-201 - 0001.db	715765,1	4648122,9	41;57;20.09267N	11;36;12.23225E	715419,40	4647892,89	41;57;12.98242N	11;35;56.92802E	
29/11/2022	09:56:08	EOL	MBSSMG-B-201	0063 - MBSSMG-B-201 - 0001.db	712623,04	4653901,23	42;00;30.33275N	11;34;03.40473E	712796,81	4653169,49	42;00;06.46187N	11;34;09.99705E	
29/11/2022	10:18:53	SOL	MBSSMG-B-202	0064 - MBSSMG-B-202 - 0001.db	712609,31	4652785,17	41;59;54.19530N	11;34;01.35394E	712261,52	4653361,74	42;00;13.20905N	11;33;47.00160E	
29/11/2022	11:10:48	EOL	MBSSMG-B-202	0065 - MBSSMG-B-202 - 0001.db	715583,96	4648104,28	41;57;19.66786N	11;36;04.34733E	714862,37	4648799,14	41;57;42.88364N	11;35;33.94735E	
29/11/2022	11:31:35	SOL	MBSSMG-B-203	0065 - MBSSMG-B-203 - 0001.db	714635,06	4648449,57	41;57;31.78344N	11;35;23.62378E	715214,27	4647591,35	41;57;03.41686N	11;35;47.63020E	
29/11/2022	12:09:35	EOL	MBSSMG-B-203	0066 - MBSSMG-B-203 - 0001.db	712104,32	4653178	42;00;07.40981N	11;33;39.93594E	712345,19	4652335,72	41;59;39.89331N	11;33;49.29997E	
29/11/2022	12:29:12	SOL	MBSSMG-B-204	0066 - MBSSMG-B-204 - 0001.db	712154,15	4651988,22	41;59;28.82268N	11;33;40.55324E					
29/11/2022	13:15:26	EOL	MBSSMG-B-204	0067 - MBSSMG-B-204 - 0001.db	715079,11	4647729,25	41;57;08.01613N	11;35;41.94677E	714251,27	4648390,43	41;57;30.24357N	11;35;06.89084E	
29/11/2022	13:38:00	SOL	MBSSMG-B-205	0067 - MBSSMG-B-205 - 0001.db	713960,36	4648046,58	41;57;19.38995N	11;34;53.81679E	714556,18	4647055,77	41;56;46.71415N	11;35;18.37252E	
29/11/2022	14:15:59	EOL	MBSSMG-B-205	0068 - MBSSMG-B-205 - 0001.db	711637,77	4652435,88	41;59;43.82304N	11;33;18.71247E	711891,31	4651542,87	41;59;14.65164N	11;33;28.56281E	
29/11/2022	14:39:02	SOL	MBSSMG-B-206	0068 - MBSSMG-B-206 - 0001.db	711687,6	4651185,48	41;59;03.27225N	11;33;19.25528E	711266,03	4651992,31	41;59;29.81424N	11;33;01.99644E	
29/11/2022	15:22:13	EOL	MBSSMG-B-206	0069 - MBSSMG-B-206 - 0001.db	714181,69	4646853,9	41;56;40.54131N	11;35;01.85963E	713624,09	4647848,4	41;57;13.29882N	11;34;38.96544E	
29/11/2022	16:03:37	SSS is on deck											
29/11/2022	16:08:52	USBL pole is elevated											
29/11/2022	16:09:06	SVP			714181,69	4646853,9	41;56;40.54131N	11;35;01.85963E					
29/11/2022	16:20:53	Start transit to Riva di Traiano Port											
29/11/2023	17:55:00	Vessel moored											
30/11/24	09:00:00	Vessel start transit to survey area B											
01/12/24	09:29:00	Transit aborted due bad sea state, vessel is moving to Area D3											
02/12/24	10:14:00	Vessel in area											
30/11/2022	10:17:05	USBL pole is lowered			726286,64	4667919,71	42;07;50.63572N	11;44;16.27566E					
30/11/2022	10:24:08	SVP			726154,52	4667834,71	42;07;48.02032N	11;44;10.40876E					
30/11/22	10:32:35	SSS is in the water			725877,81	4668278,22	42;08;02.67103N	11;43;58.98739E					
30/11/2022	10:54:03	SOL	MBSSMG-D3-Infill-01	0069 - MBSSMG-D3-Infill-01 - 0001.db	726552,63	4668206,85	42;07;59.65852N	11;44;28.24958E	726544,68	4668216,54	42;07;59.98090N	11;44;27.91711E	
30/11/2022	11:04:02	EOL	MBSSMG-D3-Infill-01	0070 - MBSSMG-D3-Infill-01 - 0001.db	727257,18	4667460,58	42;07;34.75597N	11;44;57.85833E	727247,47	4667474,22	42;07;35.20793N	11;44;57.45502E	
30/11/2022	11:13:20	SOL	MBSSMG-D3-Infill-03	0070 - MBSSMG-D3-Infill-03 - 0001.db	727278,27	4667499,72	42;07;36.00171N	11;44;58.83085E					
30/11/2022	11:17:40	EOL	MBSSMG-D3-Infill-03	0071 - MBSSMG-D3-Infill-03 - 0001.db	726947,37	4667757,3	42;07;44.68870N	11;44;44.79546E					
30/11/2022	11:51:15	SSS is on deck			725327,42	4670170,31	42;09;04.51912N	11;43;37.67051E					
30/11/2022	11:53:13	USBL pole is elevated			725286,1	4670186,25	42;09;05.07811N	11;43;35.89426E					
30/11/2022	11:57:08	Operation stopped due bad weather											
30/11/2022	11:57:45	Vessel start transit to Riva di Traiano Port											
30/11/2022	12:50:18	Vessel moored											
01/12/22	06:20:00	Vessel start transit to survey area B											
01/12/22	07:30:00	Vessel arrived to survey area B											
12/01/22	07:32:39	USBL pole is lowered											
12/01/22	08:09:33	SSS is in the water			714544,65	4651589,3	41;59;13.57111N	11;35;23.82192E	714566,45	4651699,86	41;59;17.13088N	11;35;24.91361E	
12/01/22	08:11:31	SVP	MBSSMG-B-11	0071 - MBSSMG-B-11 - 0001.db	714621,19	4651452,47	41;59;09.06379N	11;35;26.96518E	714542,13	4651617,66	41;59;14.49216N	11;35;23.74973E	
12/01/22	08:35:19	SOL	MBSSMG-B-11	0071 - MBSSMG-B-11 - 0001.db	715324,71	4649174,73	41;57;54.59523N	11;35;54.50671E	715497,03	4649807,9	41;58;14.93466N	11;36;02.82030E	
12/01/22	09:36:06	EOL	MBSSMG-B-11	0072 - MBSSMG-B-11 - 0001.db	711851,38	4642445,16	41;54;19.99744N	11;33;15.05135E					
12/01/22	11:08:47	SOL	MBSSMG-B-09	0072 - MBSSMG-B-09 - 0001.db	711853,35	4644765,75	41;55;35.16454N	11;33;18.13634E					
12/01/22	11:29:03	EOL	MBSSMG-B-09	0073 - MBSSMG-B-09 - 0001.db	712929,51	4646927,7	41;56;44.15189N	11;34;07.62673E	712355,32	4645866,07	41;56;10.32052N	11;33;41.33651E	
12/01/22	11:52:56	SOL	MBSSMG-B-10	0073 - MBSSMG-B-10 - 0001.db	712890,03	4645765,17	41;56;06.53372N	11;34;04.40200E	713229,19	4646820,48	41;56;40.38748N	11;34;20.48960E	
12/01/22	12:16:18	EOL	MBSSMG-B-10	0074 - MBSSMG-B-10 - 0001.db	711805,19	4643154,79	41;54;43.02861N	11;33;13.96519E	712054,24	4644422,38	41;55;23.84779N	11;33;26.40549E	
12/01/22	13:02:23	SOL	MBSSMG-B-213	0074 - MBSSMG-B-213 - 0001.db	711156,05	4646495,92	41;56;31.88105N	11;32;50.12133E	711720,99	4645543,3	41;56;00.47870N	11;33;13.40006E	
12/01/22	13:30:46	EOL	MBSSMG-B-213	0075 - MBSSMG-B-213 - 0001.db	709400,6	4649237,92	41;58;02.38545N	11;31;37.46763E	710042,37	4648370,59	41;57;33.67623N	11;32;04.20908E	
12/01/22	14:00:38	SOL	MBSSMG-B-212	0075 - MBSSMG-B-212 - 0001.db	710258,71	4648818,74	41;57;47.98540N	11;32;14.17409E	709665,81	4649662,31	41;58;15.87899N	11;31;49.52311E	
12/01/22	14:47:00	EOL	MBSSMG-B-212	0076 - MBSSMG-B-212 - 0001.db	712557,62	4644871,46	41;55;37.90741N	11;33;48.82177E	711951,51	4645857,66	41;56;10.43904N	11;33;23.80734E	
12/01/22	15:14:34	SOL	MBSSMG-B-211	0076 - MBSSMG-B-211 - 0001.db	712459,07	4645927,49	41;56;12.20964N	11;33;45.91716E	712853,87	4645232,64	41;55;49.31945N	11;34;02.14100E	
12/01/22	15:59:07	EOL	MBSSMG-B-211	0077 - MBSSMG-B-211 - 0001.db	709907,72	4650293,29	41;58;36.08614N	11;32;00.83442E					
12/01/22	16:35:07	SSS is on deck	MBSSMG-B-211	0077 - MBSSMG-B-211 - 0001.db	712217,13	4652297,51	41;59;38.77996N	11;33;43.68993E					
12/01/22	16:39:08	USBL pole is elevated											
12/01/22	16:39:25	Start transit to Riva di Traiano port											
12/01/22	18:30:00	Vessel moored											
12/02/22	06:18:00	Vessel start transit to survey area B											
12/02/22	07:50:00	USBL pole is lowered											
12/02/22	08:05:00	SVP											
12/02/22	08:25:00	SSS is in the water											
12/02/22	09:43:00	SOL	MBSSMG-B-210		710733,03	4649626,97	41;58;13.7N	11;32;35.8E					
12/02/22	10:53:05	EOL	MBSSMG-B-210	0078 - MBSSMG-B-210 - 0001.db	713141,63	4645464,71	41;55;56.55710N	11;34;14.92575E	712735,62	4646165,83	41;56;19.66163N	11;33;58.22395E	
12/02/22	11:25:19	SOL	MBSSMG-B-207	0078 - MBSSMG-B-207 - 0001.db	713281,34	4647617,84	41;57;06.16436N	11;34;23.79187E	713670,90	4646862,19	41;56;41.30840N	11;34;39.70879E	
12/02/22	12:07:18	EOL	MBSSMG-B-207	0079 - MBSSMG-B-207 - 0001.db	710749,15	4652001,87	41;59;30.62215N	11;32;39.56573E	711139,06	4651268,75	41;59;06.49920N	11;32;55.54776E	
12/02/22	12:41:07	SOL	MBSSMG-B-209	0079 - MBSSMG-B-209 - 0001.db	710851,23	4650242,58	41;58;33.53687N	11;32;41.72707E	710382,58	4650753,5	41;58;50.53764N	11;32;22.04069E	
12/02/22	13:48:15	EOL	MBSSMG-B-209	0080 - MBSSMG-B-209 - 0001.db	713159,42	4645463,11	41;55;56.48794N	11;34;15.69503E	713013,46	4646368	41;56;25.94049N	11;34;10.54070E	
12/02/22	14:18:38	SOL	MBSSMG-B-208	0080 - MBSSMG-B-208 - 0001.db	712944,95	4647392,75	41;56;59.20066N	11;34;08.90193E	713427,65	4646525,54	41;56;30.64072N	11;34;28.71593E	
12/02/22	14:59:25	EOL	MBSSMG-B-208	0080 - MBSSMG-B-208 - 0001.db	710871,13	4651359,67	41;59;09.70268N	11;32;44.03302E	711129,32	4650536,63	41;58;42.79407N	11;32;54.17874E	
12/02/22	15:01:58	Vessel start transit to Riva di Traiano Port											
12/02/22	15:13:55	SSS is on deck	MBSSMG-B-208	0081 - MBSSMG-B-208 - 0001.db	711447,47	4652385,32	41;59;42.36925N	11;33;10.38387E					
12/02/22	15:17:33	USBL pole is elevated											
12/02/22	17:21:33	Vessel moored											
12/06/22	06:16:26	Vessel start transit to Survey Area A											
12/06/22	07:08:28	Vessel start transit to Riva di Traiano Port											
12/06/22	08:20:31	Vessel moored											
12/07/22	06:10:25	Vessel start transit to Survey Area A											
12/07/22	08:12:36	Vessel arrived to survey area A											
12/07/22	08:14:51	SVP											
12/07/22	08:25:23	USBL pole is lowered											
12/07/22	08:53:27	SSS is in the water			701100,27	4654087,93	42;00;47.27937N	11;25;43.15061E	700699,83	4654233,21	42;00;52.35357N	11;25;25.93481E	
12/07/22	09:13:40	SOL	MBSSMG-A-101	0081 - MBSSMG-A-101 - 0001.db	700042,58	4653610,13	42;00;32.77116N	11;24;56.61930E	700528,04	4652989,64	42;00;12.22564N	11;25;16.94318E	
12/07/22	10:27:03	EOL	MBSSMG-A-101	0082 - MBSSMG-A-101 - 0001.db	695747,02	4660377,43	42;04;15.89204N	11;21;58.16458E	696528,05	4659685,28	42;03;52.76726N	11;22;31.28702E	
12/07/22	10:52:49	SOL	MBSSMG-A-102	0082 - MBSSMG-A-102 - 0001.db	696903,72	4659825,04	42;03;56.95634N	11;22;47.78870E	696278,99	4660515	42;04;19.87092N	11;22;21.46076E	
12/07/22	12:16:31	EOL	MBSSMG-A-102	0083 - MBSSMG-A-102 - 0001.db	700738,26	4652641,36	42;00;00.75052N	11;25;25.64535E	700245,71	4653803,56	42;00;38.85136N	11;25;05.68002E	

12/07/22	12:36:49	SOL	MBSSMG-A-103	0083 - MBSSMG-A-103 - 0001.db	700714,07	4654019,47	42;00;45.41648N	11;25;26.29001E	700106,91	4654476,02	42;01;00.76291N	11;25;00.47628E	
12/07/22	13:51:12	EOL	MBSSMG-A-103	0084 - MBSSMG-A-103 - 0001.db	696589,94	4660779,07	42;04;28.14567N	11;22;35.30024E	697228,27	4660114,56	42;04;06.04254N	11;23;02.25003E	
12/07/22	14:11:46	SOL	MBSSMG-A-104	0084 - MBSSMG-A-104 - 0001.db	697573,11	4660273,86	42;04;10.89125N	11;23;17.43633E	697168,61	4661103,9	42;04;38.14680N	11;23;00.85615E	
12/07/22	15:21:02	EOL	MBSSMG-A-104	0085 - MBSSMG-A-104 - 0001.db	701574,77	4652944,16	42;00;09.79042N	11;26;02.34867E	700912,26	4654154,49	42;00;49.60822N	11;25;35.06562E	
12/07/22	15:41:24	SOL	MBSSMG-A-105	0085 - MBSSMG-A-105 - 0001.db	701404,46	4654422,39	42;00;57.83405N	11;25;56.77740E	700703,93	4654651,79	42;01;05.90971N	11;25;26.62781E	
12/07/22	16:41:56	EOL	MBSSMG-A-105	0086 - MBSSMG-A-105 - 0001.db	697510,68	4661396,24	42;04;47.30758N	11;23;16.08591E	697898,69	4660573,9	42;04;20.31632N	11;23;31.95743E	
12/07/22	16:59:54	SSS is on deck											
12/07/22	17:04:21	USBL pole is elevated											
12/07/22	17:06:19	Vessel start transit to Riva di Traiano Port											
12/07/22	19:30:00	Vessel moored											
12/08/22	09:23:06	Vessel start transit to corridor D1											
12/08/22	11:32:28	Vessel arrived to corridor D1											
12/08/22	11:34:47	SVP											
12/08/22	11:40:43	USBL pole is lowered	MBSSMG-D1-1	0086 - MBSSMG-D1-1 - 0001.db	712817,93	4651959,15	41;59;27.23660N	11;34;09.33627E	712562,71	4651547,28	41;59;14.14365N	11;33;57.71886E	
12/08/22	11:55:54	SSS is in the water	MBSSMG-D1-1	0086 - MBSSMG-D1-1 - 0001.db	712826,68	4651974,97	41;59;27.74042N	11;34;09.73704E	712567,83	4651556,25	41;59;14.42907N	11;33;57.95267E	
12/08/22	12:30:07	SOL	MBSSMG-D1-1	0086 - MBSSMG-D1-1 - 0001.db	713205,81	4652534,91	41;59;45.50869N	11;34;26.92969E	712792,79	4652113,28	41;59;32.25343N	11;34;08.44582E	
12/08/22	12:48:25	EOL	MBSSMG-D1-1	0086 - MBSSMG-D1-1 - 0001.db	714079,22	4654185,39	42;00;38.11659N	11;35;07.02036E	713732,18	4653741,81	42;00;24.08796N	11;34;51.36663E	
12/08/22	12:48:37	SOL	MBSSMG-D2-1	0087 - MBSSMG-D2-1 - 0001.db	714092,63	4654208,11	42;00;38.83934N	11;35;07.63236E	713729,12	4653774,12	42;00;25.13734N	11;34;51.27576E	
12/08/22	15:17:45	EOL	MBSSMG-D2-1	0087 - MBSSMG-D2-1 - 0004.db	726881,35	4667831,66	42;07;47.16565N	11;44;42.02700E	726865,98	4667822,01	42;07;46.86913N	11;44;41.34488E	
12/08/22	15:24:59	SSS is on deck											
12/08/22	15:31:44	USBL pole is elevated											
12/08/22	15:32:30	Vessel start transit to Riva di Traiano Port											
12/08/22	15:46:33	Vessel moored											
12/12/22	06:00:00	Vessel start transit to Survey Area A											
12/12/22	07:40:00	Vessel start transit to Riva di Traiano Port due to an engine flaw											
12/12/22	09:30:00	Vessel moored											
13/12/22	06:28:00	Vessel start transit to Corridor C											
13/12/22	07:07:00	Vessel start transit to Riva di Traiano port due to technical problem											
02/02/23	09:02:22	USBL pole is lowered											
02/02/23	12:05:00	Vessel start transit to MBES calibration area											
02/02/23	12:40:56	SVP											
02/02/23	12:52:39	SOL	CAL_01	0088 - CAL_01 - 0001.db	729501,9	4658332,56	42;02;36.78790N	11;46;22.62230E					
02/02/23	12:55:21	EOL	CAL_01	0088 - CAL_01 - 0001.db	729277,52	4658163,74	42;02;31.55606N	11;46;12.63590E					
02/02/23	12:58:53	SOL	CAL_02	0089 - CAL_02 - 0001.db	729285,57	4658161,55	42;02;31.47675N	11;46;12.98263E					
02/02/23	13:01:29	EOL	CAL_02	0090 - CAL_02 - 0001.db	729514,54	4658343,62	42;02;37.13260N	11;46;23.18717E					
02/02/23	13:04:57	SOL	CAL_04	0090 - CAL_04 - 0001.db	729439,58	4658416,48	42;02;39.57113N	11;46;20.03273E					
02/02/23	13:07:50	EOL	CAL_04	0091 - CAL_04 - 0001.db	729205,48	4658230,64	42;02;33.79822N	11;46;09.60028E					
02/02/23	14:22:42	SSS is in the water			726114,77	4665973,89	42;06;47.79629N	11;44;06.08494E					
02/02/23	14:30:40	SOL	MBSSMG-D4-1	0091 - MBSSMG-D4-1 - 0001.db	725740,75	4666589,83	42;07;08.13214N	11;43;50.67334E	725801,06	4666576,76	42;07;07.64648N	11;43;53.27851E	MBES only; no signal SSS-MAG
02/02/23	15:08:07	EOL	MBSSMG-D4-1	0092 - MBSSMG-D4-1 - 0001.db	722064,97	4665773,75	42;06;45.47872N	11;41;09.65316E	722084,47	4665782,59	42;06;45.74501N	11;41;10.51368E	
02/02/23	15:18:47	SSS is on deck	MBSSMG-D4-1	0092 - MBSSMG-D4-1 - 0001.db	722064,97	4665773,75	42;06;45.47872N	11;41;09.65316E					
02/02/23	15:34:58	Vessel start transit to Riva di Traiano port due to technical problem with SSS											
02/02/23	17:02:22	Vessel moored											
02/03/23	06:17:23	Vessel start transit to Survey Area A											
02/03/23	08:00:02	SVP			729623,64	4658455,41	42;02;40.63837N	11;46;28.08485E					
02/03/23	08:33:03	MBES pole is lowered											MBES only; USBL off
02/03/23	08:48:18	SOL	MBSSMG-A-16	0092 - MBSSMG-A-16 - 0001.db	706402,64	4665261,74	42;06;44.29095N	11;29;47.64796E					MBES only; no signal SSS-MAG
02/03/23	09:52:12	EOL	MBSSMG-A-16	0093 - MBSSMG-A-16 - 0001.db	698068,32	4660459,06	42;04;16.44199N	11;23;39.19299E					
02/03/23	09:58:31	SOL	MBSSMG-A-15	0093 - MBSSMG-A-15 - 0001.db	698292,63	4660053,1	42;04;03.08717N	11;23;48.45101E					MBES only; no signal SSS-MAG
02/03/23	11:02:04	EOL	MBSSMG-A-15	0094 - MBSSMG-A-15 - 0001.db	706667,36	4664895,07	42;06;32.16273N	11;29;58.69759E					
02/03/23	11:07:20	SOL	MBSSMG-A-14	0094 - MBSSMG-A-14 - 0001.db	706878,58	4664483,8	42;06;18.64033N	11;30;07.36168E					MBES only; no signal SSS-MAG
02/03/23	12:11:20	EOL	MBSSMG-A-14	0095 - MBSSMG-A-14 - 0001.db	698462,85	4659645,89	42;03;49.74092N	11;23;55.35462E					
02/03/23	12:16:39	SOL	MBSSMG-A-13	0095 - MBSSMG-A-13 - 0001.db	698748,27	4659278,2	42;03;37.56966N	11;24;07.31396E					MBES only; no signal SSS-MAG
02/03/23	13:20:14	EOL	MBSSMG-A-13	0096 - MBSSMG-A-13 - 0001.db	707109,1	4664121,26	42;06;06.67785N	11;30;16.92662E					
02/03/23	13:25:18	SOL	MBSSMG-A-12	0096 - MBSSMG-A-12 - 0001.db	707320,6	4663759,53	42;05;54.75941N	11;30;25.66420E					MBES only; no signal SSS-MAG
02/03/23	14:30:15	EOL	MBSSMG-A-12	0096 - MBSSMG-A-12 - 0001.db	698952,15	4658880,86	42;03;24.51234N	11;24;15.69116E					
02/03/23	14:35:53	SOL	MBSSMG-A-11	0097 - MBSSMG-A-11 - 0001.db	699219	4658507,99	42;03;12.18966N	11;24;26.83455E					MBES only; no signal SSS-MAG
02/03/23	15:38:55	EOL	MBSSMG-A-11	0098 - MBSSMG-A-11 - 0001.db	707567,3	4663332,37	42;05;40.68792N	11;30;35.84821E					
02/03/23	15:43:33	SSS is on deck											
02/03/23	15:47:38	MBES pole is elevated											
02/03/23	15:53:56	Vessel start transit to Riva di Traiano port											
02/03/23	17:24:54	Vessel moored											
02/04/23	06:17:23	Vessel start transit to Survey Area A											
02/04/23	08:00:02	SVP											
02/04/23	08:15:03	MBES pole is lowered											
02/04/23	08:31:20	SOL	MBSSMG-A-10	0098 - MBSSMG-A-10 - 0001.db	707700,55	4662897,88	42;05;26.48709N	11;30;41.08821E					MBES only; no signal SSS-MAG
02/04/23	09:33:15	EOL	MBSSMG-A-10	0099 - MBSSMG-A-10 - 0001.db	699393,5	4658098,62	42;02;58.76918N	11;24;33.91772E					
02/04/23	09:40:06	SOL	MBSSMG-A-09	0099 - MBSSMG-A-09 - 0001.db	699670,11	4657739,91	42;02;46.89593N	11;24;45.50066E					MBES only; no signal SSS-MAG
02/04/23	10:46:48	EOL	MBSSMG-A-09	0100 - MBSSMG-A-09 - 0001.db	707953,75	4662521,55	42;05;14.05554N	11;30;51.61792E					
02/04/23	10:53:16	SOL	MBSSMG-A-08	0100 - MBSSMG-A-08 - 0001.db	708160,29	4662111,8	42;05;00.58587N	11;31;00.07446E					MBES only; no signal SSS-MAG
02/04/23	11:54:13	EOL	MBSSMG-A-08	0101 - MBSSMG-A-08 - 0001.db	699873,73	4657333,3	42;02;33.53762N	11;24;53.85121E					
02/04/23	12:02:19	SOL	MBSSMG-A-07	0101 - MBSSMG-A-07 - 0001.db	700027,04	4656904,51	42;02;19.50671N	11;24;59.98724E					MBES only; no signal SSS-MAG
02/04/23	13:12:59	EOL	MBSSMG-A-07	0102 - MBSSMG-A-07 - 0001.db	708385,38	4661725,19	42;04;47.84784N	11;31;09.36637E					
02/04/23	13:18:43	SOL	MBSSMG-A-06	0102 - MBSSMG-A-06 - 0001.db	708624,45	4661355,84	42;04;35.65555N	11;31;19.28778E					MBES only; no signal SSS-MAG
02/04/23	13:24:53	EOL	MBSSMG-A-06	0103 - MBSSMG-A-06 - 0001.db	707709,57	4660861,6	42;04;20.51853N	11;30;38.87775E					ABORTED due to weather
02/04/23	13:36:58	Vessel start transit to Riva di Traiano port due to weather											
02/04/23	15:25:00	Vessel moored											
02/05/23	06:21:52	Vessel start transit to Survey Area A											
02/05/23	07:51:01	SVP											
02/05/23	08:22:51	USBL pole is lowered											
02/05/23	09:12:22	SOL	MBSSMG-D4-1	0103 - MBSSMG-D4-1 - 0001.db	710585,23	4660339,63	42;04;00.85531N	11;32;43.22304E	710471,60	4660245,62	42;03;57.91984N	11;32;38.16165E	
02/05/23	11:48:10	EOL	MBSSMG-D4-1	0104 - MBSSMG-D4-1 - 0001.db	725908,23	4666620,38	42;07;08.94802N	11;43;58.00162E	725816,43	4666610,77	42;07;08.73202N	11;43;53.99453E	
02/05/23	11:57:33	SSS is on deck											
02/05/23	12:03:05	USBL pole is elevated											
02/05/23	12:05:07	Vessel start transit to Riva di Traiano port due to weather											
02/05/23	12:48:23	Vessel moored											
02/08/23	07:02:30	Vessel start transit to Survey Area A											
02/08/23	08:27:10	SVP		0104 - MBSSMG-D4-1 - 0001.db									
02/08/23	08:27:10	USBL pole is lowered		0104 - MBSSMG-D4-1 - 0001.db									
02/08/23	09:00:34	SSS is in the water		0104 - MBSSMG-A-01 - 0001.db	708922,41	4658922,66	42;03;16.55463N	11;31;29.11725E	709307,38	4659146,7	42;03;23.44293N	11;31;46.13755E	
02/08/23	09:07:54	SOL	MBSSMG-A-01	0104 - MBSSMG-A-01 - 0001.db	709762,53	4659422,19	42;03;31.92992N	11;32;06.27577E	710068,51	4659361,53	42;03;29.67082N	11;32;19.49753E	
02/08/23	10:31:28	EOL	MBSSMG-A-01	0105 - MBSSMG-A-01 - 0001.db	701438,48	4654600,68	42;01;03.57848N	11;25;58.47532E	702555,40	4655199,69	42;01;21.95104N	11;26;47.74010E	
02/08/23	11:05:50	SOL	MBSSMG-A-02	0105 - MBSSMG-A-02 - 0001.db	701204,51	4654987,39	42;01;16.32104N	11;25;48.78831E	700297,56	4654568,41	42;01;03.58104N	11;25;08.87161E	MBES REJECTED
02/08/23	12:26:58	EOL	MBSSMG-A-02	0105 - MBSSMG-A-02 - 0001.db	709466,48	4659741,02	42;03;42.54166N	11;31;53.81798E	708972,25	4659513,36	42;03;35.64078N	11;31;32.04229E	
02/08/23	12:27:08	SOL	MBSSMG-D4-1	0106 - MBSSMG-D4-1 - 0001.db	709492,25	4659755,12	42;03;42.97375N	11;31;54.95633E	709005,12	4659543,73	42;03;36.59304N	11;31;33.51002E	MBES REJECTED
02/08/23	12:40:44	EOL	MBSSMG-D4-1	0107 - MBSSMG-D4-1 - 0001.db	711093,25	4660590,38	42;04;08.48690N	11;33;05.63320E	710681,69	4660445,45	42;04;04.18987N	11;32;47.55336E	
02/08/23	12:56:23	SOL	MBSSMG-A-03	0107 - MBSSMG-A-03 - 0001.db	709359,35	4660225,57	42;03;58.34010N	11;31;49.78495E					
02/08/23	14:34:14	EOL	MBSSMG-A-03	0108 - MBSSMG-A-03 - 0001.db	699954,66	4654771,05	42;01;10.45949N	11;24;54.22371E	700982,47	4655310,08	42;01;26.97883N	11;25;39.54007E	
02/08/23	15:05:01	SOL	MBSSMG-A-04	0108 - MBSSMG-A-04 - 0001.db	700778,69	4655713,55	42;01;40.23647N	11;25;31.18332E	699703,05	4655304,73	42;01;27.97807N	11;24;43.94702E	
02/08/23	16:40:55	EOL	MBSSMG-A-04	0108 - MBSSMG-A-04 - 0002.db	709521,04	4660786,79	42;04;16.36370N	11;31;57.53674E	709116,02	4660606,78	42;04;10.92144N	11;31;39.69716E	
02/08/23	16:48:57	SSS is on deck											
02/08/23	16:59:00	USBL pole is elevated											
02/08/23	16:59:13	Vessel start transit to Riva di Traiano port											

02/08/23	18:48:07	Vessel moored											
02/11/23	05:41:37	Vessel start transit to Survey Area A											
02/11/23	07:01:15	SVP											
02/11/23	07:05:27	USBL pole is lowered											
02/11/23	07:30:10	SOL	MBSSMG-D4-1	0109 - MBSSMG-D4-1 - 0001.db	712884,74	4661439,06	42;04;34.23639N	11;34;24.62427E					MBES RE-RUN
02/11/23	07:53:12	EOL	MBSSMG-D4-1	0110 - MBSSMG-D4-1 - 0001.db	709507,82	4659840,23	42;03;45.71543N	11;31;55.74284E					
02/11/23	07:53:20	SOL	MBSSMG-A-02	0110 - MBSSMG-A-02 - 0001_ReRun.db	709487,51	4659830,45	42;03;45.41837N	11;31;54.84740E					MBES RE-RUN
02/11/23	08:52:18	EOL	MBSSMG-A-02	0111 - MBSSMG-A-02 - 0001_ReRun.db	701121,28	4654932,08	42;01;14.60600N	11;25;45.10421E					
02/11/23	08:58:11	SSS is in the water											
02/11/23	09:28:20	SOL	MBSSMG-A-05	0111 - MBSSMG-A-05 - 0001.db	700530,73	4656177,65	42;01;55.49863N	11;25;20.98117E	699693,95	4655566,32	42;01;36.46053N	11;24;43.87201E	
02/11/23	10:55:10	EOL	MBSSMG-A-05	0112 - MBSSMG-A-05 - 0001.db	709373,52	4661168,9	42;04;28.88248N	11;31;51.61540E	708915,82	4661003,79	42;04;23.97298N	11;31;31.50348E	
02/11/23	11:08:20	SOL	MBSSMG-A-06	0112 - MBSSMG-A-06 - 0001_ReRun.db	708623,24	4661353,97	42;04;35.59613N	11;31;19.23279E					
02/11/23	12:29:52	EOL	MBSSMG-A-06	0112 - MBSSMG-A-06 - 0002_ReRun.db	698789,47	4655374,19	42;01;31.06119N	11;24;04.33884E					
02/11/23	13:22:53	SOL	MBSSMG-A-07	0113 - MBSSMG-A-07 - 0001_ReRun.db	699932,87	4656709,17	42;02;13.26486N	11;24;55.65535E					
02/11/23	13:51:09	EOL		0109 - MBSSMG-A-07 - 0001_ReRun.db									
02/11/23	13:51:28	SOL	MBSSMG-A-07	0109 - MBSSMG-A-07 - 0001_ReRun.db	703489,29	4658660,3	42;03;13.18620N	11;27;32.63623E					GUI DOWN
02/11/23	14:35:24	EOL	MBSSMG-A-07	0110 - MBSSMG-A-07 - 0001_ReRun.db	708886,48	4661824,51	42;04;50.58577N	11;31;31.28280E	708449,36	4661742,63	42;04;48.35183N	11;31;12.17087E	
02/11/23	14:46:00	SOL	MBSSMG-A-08	0110 - MBSSMG-A-08 - 0001_ReRun.db	708195,13	4662134,82	42;05;01.29836N	11;31;01.61904E	708489,94	4662275,57	42;05;05.57589N	11;31;14.61912E	
02/11/23	16:07:27	EOL	MBSSMG-A-08	0111 - MBSSMG-A-08 - 0001_ReRun.db	698523,77	4656509,96	42;02;08.09621N	11;23;54.17860E	699625,71	4657194,89	42;02;29.28044N	11;24;42.90267E	
02/11/23	16:37:17	SSS is on deck											
02/11/23	16:42:22	USBL pole is elevated											
02/11/23	16:52:28	Vessel start transit to Riva di Traiano port											
02/11/23	18:48:49	Vessel moored											
02/12/23	06:02:15	Vessel start transit to Survey Area A											
02/12/23	07:35:31	SVP											
02/12/23	07:43:25	USBL pole is lowered											
02/12/23	07:50:32	SSS is in the water											
02/12/23	08:14:44	SOL	MBSSMG-A-09	0111 - MBSSMG-A-09 - 0001_ReRun.db	708003,58	4662568,92	42;05;15.54244N	11;30;53.84553E	708337,01	4662701,57	42;05;19.52107N	11;31;08.51511E	
02/12/23	09:37:22	EOL	MBSSMG-A-09	0112 - MBSSMG-A-09 - 0001_ReRun.db	698452,92	4656855,24	42;02;19.34596N	11;23;51.52045E	699262,16	4657555,38	42;02;41.29047N	11;24;27.54448E	
02/12/23	10:00:35	SOL	MBSSMG-A-10	0112 - MBSSMG-A-10 - 0001_ReRun.db	699046,98	4657804,79	42;02;49.56636N	11;24;18.49737E	697908,60	4657405,71	42;02;37.67262N	11;23;28.53500E	
02/12/23	11:18:34	EOL	MBSSMG-A-10	0112 - MBSSMG-A-10 - 0002_ReRun.db	708193,26	4662964,46	42;05;28.17406N	11;31;02.60096E	707786,21	4662913,71	42;05;26.91829N	11;30;44.83370E	
02/12/23	11:32:01	SOL	MBSSMG-A-11	0113 - MBSSMG-A-11 - 0001_ReRun.db	707521,33	4663307,06	42;05;39.91192N	11;30;33.81691E	707809,95	4663427,61	42;05;43.54189N	11;30;46.52357E	GUI DOWN - Bad weather
02/12/23	12:12:29	EOL	MBSSMG-A-11	0114 - MBSSMG-A-11 - 0001_ReRun.db									
02/12/23	12:57:46	SOL	MBSSMG_C-1	0114 - MBSSMG_C-1 - 0001.db	708874,57	4659577,6	42;03;37.81539N	11;31;27.87865E	708454,24	4660007,93	42;03;52.15633N	11;31;10.15937E	
02/12/23	13:58:40	EOL	MBSSMG_C-1	0115 - MBSSMG_C-1 - 0001.db	714452,17	4653535,7	42;00;16.70719N	11;35;22.36407E	714082,88	4654005,1	42;00;32.27334N	11;35;06.94257E	
02/12/23	14:08:55	SSS is on deck											
02/12/23	14:08:55	USBL pole is elevated											
02/12/23	14:08:55	Vessel start transit to Riva di Traiano port											
02/12/23	15:50:20	Vessel moored											
02/13/2023	05:56:07	Vessel start transit to Survey Area A											
02/13/2023	07:44:42	SVP											
02/13/2023	07:55:07	USBL pole is lowered											
02/13/2023	08:19:07	SSS is in the water			708379,59	4662981,53	42;05;28.54880N	11;31;10.72612E					
02/13/2023	08:32:53	SOL	MBSSMG-A-11	0115 - MBSSMG-A-11 - 0001_ReRun.db	707504,13	4663301,15	42;05;39.73702N	11;30;33.06131E	707821,32	4663466,88	42;05;44.80330N	11;30;47.06807E	
02/13/2023	10:00:02	EOL	MBSSMG-A-11	0116 - MBSSMG-A-11 - 0001_ReRun.db	697974,87	4657670,15	42;02;46.17899N	11;23;31.73641E	698814,34	4658248,75	42;03;04.16060N	11;24;08.92819E	
02/13/2023	10:23:24	SOL	MBSSMG-A-12	0116 - MBSSMG-A-12 - 0001_ReRun.db	698637,05	4658682,04	42;03;18.35848N	11;24;01.75140E	697653,58	4658186,44	42;03;03.19555N	11;23;18.39944E	
02/13/2023	11:43:14	EOL	MBSSMG-A-12	0117 - MBSSMG-A-12 - 0001_ReRun.db	707686,49	4663803,59	42;05;55.83852N	11;30;41.63461E	707323,45	4663710,85	42;05;53.17996N	11;30;25.72598E	
02/13/2023	12:00:36	SOL	MBSSMG-A-13_ReRun	0117 - MBSSMG-A-13_ReRun - 0001.db	707046,8	4664080,73	42;06;05.42394N	11;30;14.16517E	707389,01	4664270,23	42;06;11.23705N	11;30;29.29201E	
02/13/2023	13:05:07	EOL		0118 - MBSSMG-A-13_ReRun - 0001.db									Restart QINSy
02/13/2023	13:05:25	SOL	MBSSMG-A-13_ReRun	0118 - MBSSMG-A-13_ReRun - 0001.db	699269,61	4659596,3	42;03;47.39941N	11;24;30.36717E	700136,45	4660080,5	42;04;02.29190N	11;25;08.64752E	
02/13/2023	13:22:15	EOL	MBSSMG-A-13_ReRun	0118 - MBSSMG-A-13_ReRun - 0001.db	697644,5	4658509,76	42;03;13.67802N	11;23;18.39708E	698407,19	4659057,89	42;03;30.74303N	11;23;52.21795E	
02/13/2023	13:44:41	SOL	MBSSMG-A-14_ReRun	0119 - MBSSMG-A-14_ReRun - 0001.db	698245,55	4659409,61	42;03;42.28384N	11;23;45.61960E	697290,48	4659018,88	42;03;30.49137N	11;23;03.62609E	
02/13/2023	14:54:55	EOL	MBSSMG-A-14_ReRun	0120 - MBSSMG-A-14_ReRun - 0001.db	707262,62	4664647,15	42;06;23.56674N	11;30;24.27588E	706858,28	4664490,77	42;06;18.88527N	11;30;06.48770E	
02/13/2023	15:05:02	SSS is on deck											
02/13/2023	15:09:59	USBL pole is elevated											
02/13/2023	15:10:41	Vessel start transit to Riva di Traiano port											
02/13/2023	16:50:23	Vessel moored											
02/14/2023	05:55:09	Vessel start transit to Survey Area A											
02/14/2023	08:36:31	SVP											
02/14/2023	08:42:48	USBL pole is lowered										11;22;41.93431E	
02/14/2023	08:52:31	SSS is in the water											
02/14/2023	09:20:35	SOL	MBSSMG-A-16_ReRun	0120 - MBSSMG-A-16_ReRun - 0001.db	697876,56	4660208,7	42;04;08.50537N	11;23;30.55068E	696944,82	4659789,51	42;03;55.76833N	11;22;49.53266E	
02/14/2023	10:26:56	EOL	MBSSMG-A-16_ReRun	0121 - MBSSMG-A-16_ReRun - 0001.db	706659,06	4665526,64	42;06;52.62872N	11;29;59.14088E	706322,12	4665242,17	42;06;43.73320N	11;29;44.11994E	
02/14/2023	10:36:53	SOL	MBSSMG-A-15_ReRun	0121 - MBSSMG-A-15_ReRun - 0001.db	706595,7	4664854,84	42;06;30.92736N	11;29;55.52868E					
02/14/2023	11:52:18	EOL	MBSSMG-A-15_ReRun	0121 - MBSSMG-A-15_ReRun - 0001.db	697626,91	4659418,33	42;03;43.12739N	11;23;18.73634E	698291,01	4660061,7	42;04;03.36743N	11;23;48.39084E	
02/14/2023	12:09:55	SOL	01_TWE_MAG_Infill_A-13	0122 - 01_TWE_MAG_Infill_A-13 - 0001.db	700016,24	4659924,46	42;03;57.34734N	11;25;03.22921E	699134,73	4659587,57	42;03;47.23983N	11;24;24.49287E	
02/14/2023	12:22:59	EOL	01_TWE_MAG_Infill_A-13	0123 - 01_TWE_MAG_Infill_A-13 - 0001.db	701752,92	4660889,4	42;04;27.00749N	11;26;19.92806E	700802,85	4660496,9	42;04;15.16908N	11;25;38.13385E	
02/14/2023	12:54:40	SOL	02_TWE_SSSMAG_Infill_A-07	0123 - 02_TWE_SSSMAG_Infill_A-07 - 0001.db	701769,78	4658022,62	42;02;54.12479N	11;26;17.10563E	702619,89	4658444,76	42;03;07.01245N	11;26;54.57881E	
02/14/2023	13:07:36	EOL	02_TWE_SSSMAG_Infill_A-07	0124 - 02_TWE_SSSMAG_Infill_A-07 - 0001.db	700439,8	4657236,98	42;02;29.89883N	11;25;18.33337E	701334,07	4657799,93	42;02;47.31276N	11;25;57.89283E	
02/14/2023	13:51:18	SOL	03_TWE_SSS_Infill_A-04	0124 - 03_TWE_SSS_Infill_A-04 - 0001.db	701700,06	4656353,76	42;02;00.12748N	11;26;12.00836E					
02/14/2023	14:28:40	EOL	03_TWE_SSS_Infill_A-04	0125 - 03_TWE_SSS_Infill_A-04 - 0001.db	705986,76	4658796,65	42;03;15.26165N	11;29;21.36028E	705160,26	4658202,73	42;02;56.80081N	11;28;44.68810E	
02/14/2023	14:52:23	SOL	04_TWE_SSSMAG_Infill_A-06	0125 - 04_TWE_SSSMAG_Infill_A-06 - 0001.db	708478,14	4661182,43	42;04;30.17803N	11;31;12.70391E	708064,67	4661015,61	42;04;25.16895N	11;30;54.51324E	
02/14/2023	14:57:46	EOL	04_TWE_SSSMAG_Infill_A-06	0126 - 04_TWE_SSSMAG_Infill_A-06 - 0001.db	709165,9	4661575,95	42;04;42.26672N	11;31;43.11227E					
02/14/2023	15:16:02	SOL	05_TWE_MBESSSMAG_Infill_A-01	0126 - 05_TWE_MBESSSMAG_Infill_A-01 - 0001	709805,51	4659287,68	42;03;27.53161N	11;32;07.97079E					
02/14/2023	16:12:59	EOL	05_TWE_MBESSSMAG_Infill_A-01	0127 - 05_TWE_MBESSSMAG_Infill_A-01 - 0001	700761,46	4655307,83	42;01;27.10913N	11;25;29.93516E	701705,51	4655770,23	42;01;41.21935N	11;26;11.52282E	Restart QINSy
02/14/2023	16:13:41	SOL	05_TWE_MBESSSMAG_Infill_A-01	0127 - 05_TWE_MBESSSMAG_Infill_A-01 - 0001	704046,55	4656148,08	42;01;51.28628N	11;27;53.70985E	704987,59	4656666,63	42;02;07.20344N	11;28;35.24966E	
02/14/2023	16:33:07	EOL	05_TWE_MBESSSMAG_Infill_A-01	0128 - 05_TWE_MBESSSMAG_Infill_A-01 - 0001	701486,71	4654168,68	42;00;49.53952N	11;26;00.03691E	702627,16	4654673,51	42;01;04.83947N	11;26;50.20366E	Restart QINSy
02/14/2023	16:34:49	SOL	05_TWE_MBESSSMAG_Infill_A-01	0128 - 05_TWE_MBESSSMAG_Infill_A-01 - 0001	701935,61	4654933,27	42;01;13.89404N	11;26;20.48351E	703135,55	4655468,91	42;01;30.13384N	11;27;13.27995E	
02/14/2023	16:55:22	EOL	05_TWE_MBESSSMAG_Infill_A-01	0129 - 05_TWE_MBESSSMAG_Infill_A-01 - 0001	700600,11	4653639,32	42;00;33.20617N	11;25;20.87229E	701226,62	4654507,07	42;01;00.74105N	11;25;49.15603E	
02/14/2023	17:00:02	SOL	MB-CANYON	0129 - MB-CANYON - 0001.db	701197,66	4653439,7	42;00;26.19038N	11;25;46.58154E	700851,93	4654190,06	42;00;50.81609N	11;25;32.48870E	
02/14/2023	17:32:34	EOL	MB-CANYON	0130 - MB-CANYON - 0001.db	705888,05	4653631,88	42;00;28.05122N	11;29;10.54367E					
02/14/2023	17:34:41	SSS is on deck											
02/14/2023	17:37:44	USBL pole is elevated											
02/14/2023	17:37:52	Vessel start transit to Riva di Traiano port											
02/14/2023	19:40:37	Vessel moored											
02/15/2023	07:25:35	Vessel start transit to Extra Work Area											
02/15/2023	09:08:17	SVP											
02/15/2023	09:19:54	USBL pole is lowered											
02/15/2023	09:23:23	SSS is in the water											
02/15/2023	09:57:34	SOL	Box-in_Line01	0130 - Box-in_Line01 - 0001.db	705929,61	4663445,25	42;05;45.89718N	11;29;24.76500E	706263,86	4663597,84	42;05;50.52409N	11;29;39.49607E	
02/15/2023	10:04:37	EOL	Box-in_Line01	0131 - Box-in_Line01 - 0001.db	705366,43	4663130,83	42;05;36.24332N	11;28;59.87235E	705704,08	4663287,92	42;05;41.01386N	11;29;14.75644E	
02/15/2023	10:19:16	SOL	Box-in_Line02	0131 - Box-in_Line02 - 0001.db	705622,22	4663151,81	42;05;36.68204N	11;29;11.02378E	705331,10	4662993,19	42;05;31.81800N	11;28;58.16195E	
02/15/2023	10:26:35	EOL	Box-in_Line02	0132 - Box-in_Line02 - 0001.db	706357,21	4663597,54	42;05;50.42620N	11;29;43.55595E	705975,34	4663393,42	42;05;44.17511N	11;29;26.68796E	
02/15/2023	10:42:13	SOL	Box-in_Line03	0132 - Box-in_Line03 - 0001.db	705786,02	4663490,7	42;05;47.50518N	11;29;18.57736E	705708,64	4663766,41	42;05;56.50928N	11;29;15.56090E	
02/15/2023	10:48:44	EOL	Box-in_Line03	0133 - Box-in_Line03 - 0001.db	706069,41	4662868,26	42;05;27.07479N	11;29;30.11304E	705920,96	4663259,63	42;05;39.89277N	11;29;24.15304E	
02/15/2023	11:05:02	SSS is on deck											
02/15/2023	11:08:54	USBL pole is elevated											
02/15/2023	11:09:23	Vessel start transit to Riva di Traiano port											
02/15/2023	12:44:25	Vessel moored											
		FASE 2											
02/16/2023	10:51:24	Vessel start transit to corridor C											
02/16/2023	12:36:50	SBP pole is lowered											
02/16/2023	12:50:10	SPK is in the water											
02/16/2023	13:28:10	SOL	SPKSBP-C	0133 - SPKSBP-C - 0001.db	714033,59	4654040,29	42;00;33.46123N	11;35;04.84806E	714058,97	4654014,17	42;00;32.59052N	11;35;05.91610E	

02/16/2023	14:33:36	EOL	SPKSBP-C	0134 - SPKSBP-C - 0001.db	708849,08	4659611,11	42;03;38.92494N	11;31;26.81351E	708874,93	4659585,47	42;03;38.06984N	11;31;27.90462E	
02/16/2023	15:08:51	SOL	SPK-5	0134 - SPK-5 - 0001.db	705626,74	4656568,08	42;02;03.41058N	11;29;02.89777E	705632,40	4656603,98	42;02;04.56789N	11;29;03.18903E	
02/16/2023	16:22:22	EOL	SPK-5	0135 - SPK-5 - 0001.db	704186,85	4649762,13	41;58;24.28927N	11;27;51.81474E	704197,91	4649796,61	41;58;25.39610N	11;27;52.33810E	
02/16/2023	16:31:23	SPK is on deck	SPK-5	0135 - SPK-5 - 0001.db	704887,76	4649652,88	41;58;20.09554N	11;28;22.10467E	704853,95	4649639,36	41;58;19.68916N	11;28;20.62009E	
02/16/2023	16:32:21	SBP pole is elevated	SPK-5	0135 - SPK-5 - 0001.db	704971,91	4649688,25	41;58;21.16265N	11;28;25.80180E	704938,16	4649674,58	41;58;20.75141N	11;28;24.31948E	
02/16/2023	16:32:25	Vessel start transit to Riva di Traiano port											
02/16/2023	18:35:22	Vessel moored											
02/17/2023	06:00:21	Vessel start transit to Survey Area A											
02/17/2023	07:54:32	SBP pole is lowered	SPKSBP-A8	0135 - SPKSBP-A8 - 0001.db	706073,34	4666187,83	42;07;14.60087N	11;29;34.49821E	706103,59	4666200,95	42;07;14.99729N	11;29;35.83135E	
02/17/2023	08:06:15	SPK is in the water	SPKSBP-A8	0135 - SPKSBP-A8 - 0001.db	706453,03	4665773,98	42;07;00.83597N	11;29;50.49184E	706462,36	4665809,07	42;07;01.96372N	11;29;50.94272E	
02/17/2023	08:10:17	SOL	SPKSBP-A8	0135 - SPKSBP-A8 - 0001.db	706204,75	4665430,36	42;06;49.94030N	11;29;39.25320E	706233,20	4665452,93	42;06;50.64429N	11;29;40.51971E	
02/17/2023	09:49:46	EOL	SPKSBP-A8	0136 - SPKSBP-A8 - 0001.db	696250	4659690,63	42;03;53.19073N	11;22;19.20518E	696280,71	4659710,15	42;03;53.79551N	11;22;20.56381E	
02/17/2023	10:03:40	SOL	SPKSBP-A7	0136 - SPKSBP-A7 - 0001.db	696806,23	4658849,48	42;03;25.44049N	11;22;42.36999E	696775,12	4658830,59	42;03;24.85645N	11;22;40.99500E	
02/17/2023	11:44:54	EOL	SPKSBP-A7	0137 - SPKSBP-A7 - 0001.db	706704,76	4664561,4	42;06;21.31875N	11;29;59.89963E	706672,44	4664544,66	42;06;20.80721N	11;29;58.47245E	
02/17/2023	11:55:20	SOL	SPKSBP-A6	0137 - SPKSBP-A6 - 0001.db	707152,81	4663673,07	42;05;52.11839N	11;30;18.25622E	707183,40	4663692,46	42;05;52.71732N	11;30;19.61106E	
02/17/2023	13:34:43	EOL	SPKSBP-A6	0138 - SPKSBP-A6 - 0001.db	697254,94	4657960,93	42;02;56.25055N	11;23;00.79863E	697285,98	4657979,91	42;02;56.83738N	11;23;02.17093E	
02/17/2023	13:45:35	SOL	SPKSBP-A5	0138 - SPKSBP-A5 - 0001.db	697812,74	4657123,31	42;02;28.61083N	11;23;24.02549E	697782,42	4657103,15	42;02;27.98532N	11;23;22.68360E	
02/17/2023	15:22:46	EOL	SPKSBP-A5	0139 - SPKSBP-A5 - 0001.db	707701,14	4662839,41	42;05;24.59246N	11;30;41.03880E	707668,73	4662822,77	42;05;24.08423N	11;30;39.60826E	
02/17/2023	15:32:15	SPK is on deck											
02/17/2023	15:35:45	SBP pole is elevated											
02/17/2023	15:36:14	Vessel start transit to Riva di Traiano port											
02/17/2023	17:21:19	Vessel moored											
02/18/2023	06:14:44	Vessel start transit to Survey Area A											
02/18/2023	07:59:00	SBP pole is lowered											
02/18/2023	08:05:56	SPK is in the water											
02/18/2023	08:09:20	SOL	SPKSBP-A4	0139 - SPKSBP-A4 - 0001.db	708389,35	4662069,17	42;04;58.98622N	11;31;09.98048E	708421,44	4662086,28	42;04;59.50982N	11;31;11.39757E	
02/18/2023	09:45:14	EOL	SPKSBP-A4	0140 - SPKSBP-A4 - 0001.db	698254,14	4656221,06	42;01;58.98214N	11;23;42.11010E	698284,49	4656241,18	42;01;59.60633N	11;23;43.45366E	
02/18/2023	09:55:19	SOL	SPKSBP-A3	0140 - SPKSBP-A3 - 0001.db	698796,42	4655380,77	42;01;31.26785N	11;24;04.64876E	698765,96	4655360,93	42;01;30.65287N	11;24;03.30147E	
02/18/2023	11:36:56	EOL	SPKSBP-A3	0141 - SPKSBP-A3 - 0001.db	708781,88	4661141,88	42;04;28.57422N	11;31;25.85784E	708746,46	4661133,55	42;04;28.33824N	11;31;24.30724E	
02/18/2023	11:45:35	SOL	SPKSBP-A2	0141 - SPKSBP-A2 - 0001.db	709250,25	4660264,83	42;03;59.71630N	11;31;45.09290E	709279,16	4660286,86	42;04;00.40203N	11;31;46.37773E	
02/18/2023	13:25:06	EOL	SPKSBP-A2	0142 - SPKSBP-A2 - 0001.db	699251,83	4654496,67	42;01;02.21270N	11;24;23.35474E	699281,80	4654517,33	42;01;02.85467N	11;24;24.68232E	
02/18/2023	13:34:01	SOL	SPKSBP-A1	0142 - SPKSBP-A1 - 0001.db	699801,73	4653657,02	42;00;34.51033N	11;24;46.21529E	699771,08	4653637,42	42;00;33.90331N	11;24;44.85994E	
02/18/2023	15:15:22	EOL	SPKSBP-A1	0143 - SPKSBP-A1 - 0001.db	709726,19	4659388,42	42;03;30.87088N	11;32;04.65268E	709694,42	4659370,61	42;03;30.32447N	11;32;03.24878E	
02/18/2023	15:22:19	SPK is on deck											
02/18/2023	15:25:20	SBP pole is elevated											
02/18/2023	15:26:03	Vessel start transit to Riva di Traiano port											
02/18/2023	16:56:48	Vessel moored											
02/19/2023	05:50:34	Vessel start transit to Canyon Survey Area											
02/19/2023	08:22:13	SBP pole is lowered											
02/19/2023	08:30:15	SPK is in the water											
02/19/2023	08:40:23	SOL	SPK-4	0143 - SPK-4 - 0001.db	701462,21	4649355,05	41;58;13.62569N	11;25;53.03241E	701480,16	4649323,67	41;58;12.59262N	11;25;53.77279E	
02/19/2023	09:27:50	EOL	SPK-4	0144 - SPK-4 - 0001.db	699221,37	4653961,77	42;00;44.91230N	11;24;21.37808E	699239,15	4653930,19	42;00;43.87276N	11;24;22.11180E	
02/19/2023	09:53:46	SOL	SPK-1	0144 - SPK-1 - 0001.db	697867,23	4652780,04	42;00;07.85872N	11;23;21.12155E	697833,30	4652766,92	42;00;07.46418N	11;23;19.63208E	
02/19/2023	10:27:18	EOL	SPK-1	0145 - SPK-1 - 0001.db	701410,46	4653988,75	42;00;43.78089N	11;25;56.50225E	701376,31	4653976,19	42;00;43.40559N	11;25;55.00349E	
02/19/2023	10:47:59	SOL	SPK-2	0145 - SPK-2 - 0001.db	703516,5	4655563,45	42;01;32.84204N	11;27;29.94871E	703480,28	4655567,31	42;01;33.00066N	11;27;28.38003E	
02/19/2023	11:25:53	EOL	SPK-2	0146 - SPK-2 - 0001.db	707574,45	4655030,45	42;01;11.76098N	11;30;25.56897E	707538,53	4655036,59	42;01;11.99410N	11;30;24.01641E	
02/19/2023	11:43:59	SOL	SPK-6	0146 - SPK-6 - 0001.db	707736,66	4653552,6	42;00;23.73532N	11;30;30.73295E	707704,07	4653536,37	42;00;23.24027N	11;30;29.29716E	
02/19/2023	12:10:27	EOL	SPK-6	0147 - SPK-6 - 0001.db	710269,89	4654743,09	42;00;59.87727N	11;32;22.28853E	710237,29	4654726,76	42;00;59.37952N	11;32;20.85169E	
02/19/2023	12:43:55	SOL	SPK-3	0147 - SPK-3 - 0001.db	709108,36	4655798,95	42;01;35.19279N	11;31;33.18882E	709099,19	4655834,18	42;01;36.34270N	11;31;32.83565E	
02/19/2023	13:11:23	EOL	SPK-3	0148 - SPK-3 - 0001.db	710476,7	4652941,83	42;00;01.33171N	11;32;28.94803E	710459,15	4652973,75	42;00;02.38257N	11;32;28.22708E	
02/19/2023	13:35:35	SOL	SPKSBP-B1	0148 - SPKSBP-B1 - 0001.db	712978,98	4653271,51	42;00;09.58901N	11;34;18.04150E	712997,62	4653302,66	42;00;10.57972N	11;34;18.89150E	SBP DOWN ≈ 500 m before EOL
02/19/2023	14:28:46	EOL	SPKSBP-B1	0149 - SPKSBP-B1 - 0001.db	709994,98	4648082,17	41;57;24.37883N	11;32;01.78193E	710012,23	4648114,17	41;57;25.39905N	11;32;02.57168E	
02/19/2023	14:44:35	SOL	SPKSBP-B2	0149 - SPKSBP-B2 - 0001.db	710577,36	4647094,45	41;56;51.82544N	11;32;25.78423E	710556,64	4647064,57	41;56;50.87743N	11;32;24.84654E	
02/19/2023	15:37:47	EOL	SPKSBP-B2	0149 - SPKSBP-B2 - 0001.db	713550,86	4652233,22	41;59;35.40015N	11;34;41.51796E	713534,63	4652200,68	41;59;34.36209N	11;34;40.77029E	
02/19/2023	15:51:26	SOL	SPKSBP-D1	0150 - SPKSBP-D1 - 0001.db	712874,14	4652051,15	41;59;30.16183N	11;34;11.89699E	712858,42	4652018,35	41;59;29.11465N	11;34;11.17140E	
02/19/2023	16:13:54	EOL	SPKSBP-D1	0151 - SPKSBP-D1 - 0001.db	714055,7	4654124,51	42;00;36.16759N	11;35;05.91864E	714038,93	4654092,25	42;00;35.13899N	11;35;05.14822E	
02/19/2023	16:20:30	SPK is on deck											
02/19/2023	16:25:02	SBP pole is elevated											
02/19/2023	16:25:34	Vessel start transit to Riva di Traiano port											
02/19/2023	17:43:30	Vessel moored											
02/20/2023	07:07:52	Vessel start transit to Survey Area ~~B~~											
02/20/2023	08:35:22	SBP pole is lowered											
02/20/2023	08:41:10	SPK is in the water											
02/20/2023	08:45:59	SOL	SPKSBP-B3	0151 - SPKSBP-B3 - 0001.db	714120,79	4651225,42	41;59;02.19956N	11;35;04.94254E	714136,63	4651258,09	41;59;03.24238N	11;35;05.67321E	
02/20/2023	09:39:42	EOL	SPKSBP-B3	0152 - SPKSBP-B3 - 0001.db	711148,43	4646075,14	41;56;18.25828N	11;32;49.24792E	711169,54	4646104,79	41;56;19.19832N	11;32;50.20226E	
02/20/2023	09:56:42	SOL	SPKSBP-B4	0152 - SPKSBP-B4 - 0001.db	711695,58	4645050,49	41;55;44.54003N	11;33;11.66102E	711671,80	4645023,03	41;55;43.67365N	11;33;10.59391E	NO REC SBP
02/20/2023	10:49:22	EOL	SPKSBP-B4	0153 - SPKSBP-B4 - 0001.db	714712,42	4650258,86	41;58;30.31250N	11;35;29.35736E	714694,31	4650227,26	41;58;29.30656N	11;35;28.52940E	
02/20/2023	11:01:57	SOL	SPKSBP-B5	0153 - SPKSBP-B5 - 0001.db	715264	4649196,93	41;57;55.37427N	11;35;51.90129E	715270,22	4649232,72	41;57;56.52742N	11;35;52.21815E	
02/20/2023	11:54:59	EOL	SPKSBP-B5	0153 - SPKSBP-B5 - 0001.db	712300,6	4644078,1	41;55;12.45773N	11;33;36.64496E	712318,55	4644109,75	41;55;13.46545N	11;33;37.46470E	
02/20/2023	12:08:39	SOL	SPKSBP-B6	0154 - SPKSBP-B6 - 0001.db	712877,23	4643093,12	41;54;39.99373N	11;34;00.37488E	712858,61	4643061,9	41;54;39.00054N	11;33;59.52673E	
02/20/2023	13:01:29	EOL	SPKSBP-B6	0155 - SPKSBP-B6 - 0001.db	715872,22	4648260,82	41;57;24.45426N	11;36;17.06258E	715856,15	4648228,16	41;57;23.41218N	11;36;16.32218E	
02/20/2023	13:09:07	SPK is on deck	SPKSBP-B4	0155 - SPKSBP-B4 - 0001.db	715658,75	4650060,09	41;58;22.94416N	11;36;10.17246E	715682,46	4650032,51	41;58;22.02735N	11;36;11.16530E	
02/20/2023	13:22:33	SOL	SPKSBP-B4	0155 - SPKSBP-B4 - 0001.db	714693,46	4650214,77	41;58;28.90270N	11;35;28.47615E	714718,98	4650240,61	41;58;29.71494N	11;35;29.61784E	SBP ONLY
02/20/2023	14:05:12	EOL	SPKSBP-B4	0156 - SPKSBP-B4 - 0001.db	711725,95	4645081,99	41;55;45.53108N	11;33;13.01884E	711743,64	4645113,82	41;55;46.54527N	11;33;13.82772E	
02/20/2023	14:32:56	SOL	TWE_SBP_Infill_B1	0156 - TWE_SBP_Infill_B1 - 0001.db	710233,3	4648546,47	41;57;39.19009N	11;32;12.72127E	710202,79	4648526,74	41;57;38.58050N	11;32;11.37190E	SBP ONLY
02/20/2023	14:39:24	EOL	TWE_SBP_Infill_B1	0157 - TWE_SBP_Infill_B1 - 0001.db	710741,73	4649372,08	41;58;05.44515N	11;32;35.85112E	710724,16	4649340,2	41;58;04.42921N	11;32;35.04748E	
02/20/2023	14:42:58	SBP pole is elevated											
02/20/2023	14:52:36	Vessel start transit to Riva di Traiano port											
02/20/2023	16:18:59	Vessel moored											
02/21/2023	07:54:41	Vessel start transit to Extra Work Area											
02/21/2023	09:16:36	SBP pole is lowered	EW_SPKSBP-08	0157 - EW_SPKSBP-08 - 0001.db	701575,74	4648033,98	41;57;30.72508N	11;25;56.33169E	701604,12	4648020,75	41;57;30.27048N	11;25;57.54703E	
02/21/2023	09:20:56	SPK is in the water	EW_SPKSBP-04	0159 - EW_SPKSBP-04 - 0001.db	698694,37	4661279,97	42;04;42.46647N	11;24;07.41661E	698706,66	4661245,69	42;04;41.34470N	11;24;07.90918E	
02/21/2023	09:27:00	SOL	EW_SPKSBP-08	0157 - EW_SPKSBP-08 - 0001.db	701375,99	4649036,49	41;58;03.38506N	11;25;48.89689E	701383,93	4649000,97	41;58;02.22711N	11;25;49.19816E	
02/21/2023	10:25:31	EOL	EW_SPKSBP-08	0158 - EW_SPKSBP-08 - 0001.db	700238,3	4655675,69	42;01;39.50581N	11;25;07.65736E	700246,34	4655640,26	42;01;38.35052N	11;25;07.96350E	
02/21/2023	10:52:03	SOL	EW_SPKSBP-05	0158 - EW_SPKSBP-05 - 0001.db	702444,86	4654805,27	42;01;09.27636N	11;26;42.44808E	702465,09	4654775,11	42;01;08.28067N	11;26;43.28942E	
02/21/2023	11:56:29	EOL	EW_SPKSBP-05	0159 - EW_SPKSBP-05 - 0001.db	698715,7	4661234,41	42;04;40.97093N	11;24;08.28856E	698735,78	4661204,11	42;04;39.97115N	11;24;09.12465E	
02/21/2023	12:29:00	SOL	EW_SPKSBP-04	0159 - EW_SPKSBP-04 - 0001.db	701122,89	4662745,4	42;05;27.71292N	11;25;54.83109E	701104,22	4662776,64	42;05;28.74214N	11;25;54.05756E	
02/21/2023	13:34:25	EOL	EW_SPKSBP-04	0160 - EW_SPKSBP-04 - 0001.db	704792,19	4656389,81	42;01;58.41922N	11;28;26.41115E	704772,78	4656420,64	42;01;59.43617N	11;28;25.60651E	
02/21/2023	13:39:33	SPK is on deck											
02/21/2023	13:41:35	SBP pole is elevated											
02/21/2023	13:42:43	Vessel start transit to Riva di Traiano port											
02/21/2023	15:39:45	Vessel moored											
02/22/2023	05:54:35	Vessel start transit to Extra Work Area											
02/22/2023	07:36:54	SBP pole is lowered											
02/22/2023	07:41:55	SPK is in the water											
02/22/2023	07:46:30	SOL	EW_SPKSBP-03	0160 - EW_SPKSBP-03 - 0001.db	714472,44	4645507,22	41;55;56.63643N	11;35;12.71014E	714493,97	4645477,86	41;55;55.66461N	11;35;13.60591E	
02/22/2023	11:07:57	EOL	EW_SPKSBP-03	0161 - EW_SPKSBP-03 - 0001.db	703722,18	4664112,79	42;06;09.59478N	11;27;49.59251E	703740,30	4664081,22	42;06;08.55518N	11;27;50.34076E	
02/22/2023	12:02:59	SOL	EW_SPKSBP-02	0161 - EW_SPKSBP-02 - 0001.db	705657,85	4658019,91	42;02;50.41061N	11;29;06.08316E	705626,00	4658002,25	42;02;49.86840N	11;29;04.67663E	
02/22/2023	15:20:45	EOL	EW_SPKSBP-02	0162 - EW_SPKSBP-02 - 0001.db	725813,53	4666604,58	42;07;08.53456N	11;43;53.85989E	725777,57	4666599,05	42;07;08.39275N	11;43;52.28788E	
02/22/2023	15:26:21	SPK is on deck											
02/22/2023	15:30:24	SBP pole is elevated											
02/22/2023	15:31:06	Vessel start transit to Riva di Traiano port											
02/22/2023	16:07:24	Vessel moored											
02/23/2023	05:51:51	Vessel start transit to Extra Work Area											

02/23/2023	07:01:46	SBP pole is lowered											
02/23/2023	07:04:47	SPK is in the water											
02/23/2023	07:12:28	SOL	EW_SPKSBP-07	0162 - EW_SPKSBP-07 - 0001.db	717033,65	4656551,16	42;01;51.83181N	11;37;18.48351E	717069,08	4656542,84	42;01;51.52718N	11;37;20.01149E	
02/23/2023	08:48:18	EOL	EW_SPKSBP-07	0163 - EW_SPKSBP-07 - 0001.db	707026,66	4657993,29	42;02;48.25509N	11;30;05.53747E	707062,75	4657989,01	42;02;48.08252N	11;30;07.10061E	
02/23/2023	08:59:32	SOL	EW_SPKSBP-09	0163 - EW_SPKSBP-09 - 0001.db	706027,06	4658576,6	42;03;08.09561N	11;29;22.83352E	706031,79	4658612,62	42;03;09.25800N	11;29;23.08480E	
02/23/2023	09:25:17	EOL	EW_SPKSBP-09	0163 - EW_SPKSBP-09 - 0001.db	705511,13	4656071,88	42;01;47.44547N	11;28;57.24852E	705515,86	4656107,83	42;01;48.60583N	11;28;57.49925E	
02/23/2023	10:48:38	SOL	EW_SPKSBP-06	0164 - EW_SPKSBP-06 - 0001.db	712949,39	4647450,15	41;57;01.05566N	11;34;09.16917E	712947,34	4647413,83	41;56;59.88107N	11;34;09.03334E	
02/23/2023	12:08:27	EOL	EW_SPKSBP-06	0165 - EW_SPKSBP-06 - 0001.db	713869,54	4655812,55	42;01;31.02668N	11;35;00.04755E	713868,48	4655776,25	42;01;29.85211N	11;34;59.95427E	STOP REC DUE TO ROPE
02/23/2023	12:23:03	SOL	EW_SPKSBP-06	0165 - EW_SPKSBP-06 - 0001.db	713824,93	4655528,39	42;01;21.86629N	11;34;57.73714E	713821,33	4655492,22	42;01;20.69814N	11;34;57.53308E	
02/23/2023	12:39:14	EOL	EW_SPKSBP-06	0166 - EW_SPKSBP-06 - 0001.db	714024,21	4657211	42;02;16.17232N	11;35;08.60364E	714022,23	4657174,7	42;02;14.99831N	11;35;08.46999E	
02/23/2023	12:53:09	SOL	EW_SPKSBP-10	0166 - EW_SPKSBP-10 - 0001.db	712940,11	4656008,46	42;01;38.27990N	11;34;19.92699E	712972,52	4656025,03	42;01;38.78505N	11;34;21.35684E	
02/23/2023	13:21:02	EOL	EW_SPKSBP-10	0167 - EW_SPKSBP-10 - 0001.db	710107,64	4654663,18	42;00;57.44471N	11;32;15.13781E	710140,28	4654679,28	42;00;57.93492N	11;32;16.57667E	
02/23/2023	13:48:07	SOL	EW_SPKSBP-01	0167 - EW_SPKSBP-01 - 0001.db	712198,15	4652113,99	41;59;32.85397N	11;33;42.62741E	712177,38	4652084,18	41;59;31.90846N	11;33;41.68646E	UNFINISHED
02/23/2023	15:58:17	EOL	EW_SPKSBP-01	0168 - EW_SPKSBP-01 - 0001.db	722133,66	4662753,47	42;05;07.58863N	11;41;08.50954E	722109,43	4662726,34	42;05;06.73438N	11;41;07.41920E	
02/23/2023	16:04:31	SPK is in the water											
02/23/2023	16:06:56	SBP pole is lowered											
02/23/2023	16:07:01	Vessel start transit to Riva di Traiano port											
02/23/2023	16:50:24	Vessel moored											
02/24/2023	05:54:18	Vessel start transit to Extra Work Area											
02/24/2023	06:59:43	SBP pole is lowered											
02/24/2023	06:59:44	SPK is in the water											
02/24/2023	07:01:54	SOL	EW_SPKSBP-01	0168 - EW_SPKSBP-01 - 0001.db	719992,12	4660450,62	42;03;55.17283N	11;39;32.27930E	719966,59	4660424,71	42;03;54.35919N	11;39;31.13466E	
02/24/2023	08:18:50	EOL	EW_SPKSBP-01	0169 - EW_SPKSBP-01 - 0001.db	725131,55	4665912,15	42;06;46.81477N	11;43;23.23250E	725100,69	4665931,01	42;06;47.45735N	11;43;21.91599E	STOP REC DUE TO POWER WENT OFF
02/24/2023	08:29:34	SOL	EW_SPKSBP-01	0169 - EW_SPKSBP-01 - 0001.db	724630,07	4665429,97	42;06;31.71599N	11;43;00.75211E	724609,15	4665400,23	42;06;30.77423N	11;42;59.80110E	
02/24/2023	08:53:46	EOL	EW_SPKSBP-01	0170 - EW_SPKSBP-01 - 0001.db	726362,33	4667269,93	42;07;29.51323N	11;44;18.66173E	726336,69	4667244,14	42;07;28.70474N	11;44;17.51026E	
02/24/2023	09:02:22	SPK is on deck											
02/24/2023	09:02:24	SBP pole is elevated											
02/24/2023	09:03:14	Vessel start transit to Riva di Traiano port											
02/24/2023	09:42:21	Vessel moored											
		FASE 3											
Date	UTC Time	Status	Line Name	Storage .db	Easting Vessel	Northing Vessel	Lat_Vessel	Lon Vessel	Easting Sampling Point	Northing Sampling Point	Lat Sampling Point	Long Sampling Point	Note
03/03/23	08:44:27	Vessel Start Transit to work area			732492,72	4660835,78	42;03;54.69147N	11;48;36.13900E					
03/03/23	09:29:24	USBL pole is lowered			726367,31	4667341,5	42;07;31.82589N	11;44;18.97809E					
03/03/23	09:38:29	SVP			726541,19	4667338,83	42;07;31.55864N	11;44;26.53894E					
03/03/23	09:41:05	ROV is in the water			726501,72	4667368,25	42;07;32.55260N	11;44;24.86301E					
03/03/23	10:08:35	SOL	Transetto_05	0170 - Transetto_05 - 0001.db	726366,53	4667468,73	42;07;35.94730N	11;44;19.12179E					
03/03/23	10:23:50	EOL	Transetto_05	0171 - Transetto_05 - 0001.db	726391,62	4667453,03	42;07;35.41266N	11;44;20.19150E					Current problem
03/03/23	10:26:02	ROV is out of the water			726363,8	4667454,95	42;07;35.50381N	11;44;18.98359E					
03/03/23	10:26:04	ROV is on deck			726363,77	4667454,62	42;07;35.49317N	11;44;18.98200E					
03/03/23	11:05:47	ROV is off deck			726477,16	4667417,41	42;07;34.17022N	11;44;23.86314E					
03/03/23	11:05:49	ROV is in the water			726477,5	4667417,63	42;07;34.17690N	11;44;23.87802E					
03/03/23	11:12:46	SOL	Transetto_05	0171 - Transetto_05 - 0001.db	726488,09	4667423,15	42;07;34.34470N	11;44;24.34645E					
03/03/23	11:38:13	EOL	Transetto_05	0172 - Transetto_05 - 0001.db	726502,14	4667423,72	42;07;34.34855N	11;44;24.95858E					
03/03/23	11:48:56	ROV is out of the water			726509,8	4667423,37	42;07;34.32934N	11;44;25.29163E					
03/03/23	11:49:12	ROV is on deck			726509,52	4667422,82	42;07;34.31172N	11;44;25.27831E					
03/03/23	12:17:24	ROV is off deck			726453	4667288,27	42;07;30.01301N	11;44;22.63159E					
03/03/23	12:17:44	ROV is in the water			726454,53	4667288,33	42;07;30.01340N	11;44;22.69816E					
03/03/23	12:26:19	SOL	Transetto_04	0172 - Transetto_04 - 0001.db	726446	4667289,68	42;07;30.06584N	11;44;22.32920E					
03/03/23	12:37:54	EOL	Transetto_04	0173 - Transetto_04 - 0001.db	726455,29	4667287,15	42;07;29.97437N	11;44;22.72994E					Stop line due ROV problem
03/03/23	12:44:51	SOL	Transetto_04	0173 - Transetto_04 - 0001.db	726454,15	4667287,03	42;07;29.97153N	11;44;22.67982E					
03/03/23	12:54:50	EOL	Transetto_04	0173 - Transetto_04 - 0001.db	726456,95	4667287,58	42;07;29.98662N	11;44;22.80238E					Stop line due ROV problem
03/03/23	13:11:37	ROV is out of the water			726457,36	4667286,99	42;07;29.96709N	11;44;22.81977E					
03/03/23	13:12:10	ROV is on deck			726460,09	4667287,08	42;07;29.96727N	11;44;22.93829E					
03/03/23	13:28:43	ROV is off deck			726514,19	4667389,2	42;07;33.21805N	11;44;25.43466E					
03/03/23	13:28:57	ROV is in the water			726515,11	4667388,89	42;07;33.20719N	11;44;25.47437E					
03/03/23	13:35:25	SOL	Transetto_04	0174 - Transetto_04 - 0001.db	726524,62	4667384,42	42;07;33.05252N	11;44;25.88169E					
03/03/23	13:52:02	EOL	Transetto_04	0175 - Transetto_04 - 0001.db	726521,58	4667392,48	42;07;33.31668N	11;44;25.76068E					
03/03/23	13:59:08	ROV is out of the water			726519,55	4667389,06	42;07;33.20801N	11;44;25.66759E					
03/03/23	13:59:43	ROV is on deck			726520,44	4667388,86	42;07;33.20069N	11;44;25.70632E					
03/03/23	14:21:53	ROV is off deck			726509,7	4667355,37	42;07;32.12714N	11;44;25.19208E					
03/03/23	14:22:55	ROV is in the water			726507,58	4667359,53	42;07;32.26425N	11;44;25.10578E					
03/03/23	14:28:13	SOL	Transetto_04	0175 - Transetto_04 - 0001.db	726509,24	4667379,1	42;07;32.89617N	11;44;25.20525E					
03/03/23	15:04:58	EOL	Transetto_04	0176 - Transetto_04 - 0001.db	726669,75	4667634,61	42;07;41.00423N	11;44;32.54542E					
03/03/23	15:10:22	ROV is out of the water			726710,59	4667668,17	42;07;42.04843N	11;44;34.36916E					
03/03/23	15:10:41	ROV is on deck			726711,4	4667670,87	42;07;42.13509N	11;44;34.40793E					
03/03/23	15:22:03	ROV is off deck			726383,9	4667779,46	42;07;45.99251N	11;44;20.31130E					
03/03/23	15:22:42	ROV is in the water			726385,2	4667771,69	42;07;45.73970N	11;44;20.35697E					
03/03/23	15:26:16	SOL	Transetto_02	0176 - Transetto_02 - 0001.db	726425,27	4667750,33	42;07;45.00628N	11;44;22.07029E					
03/03/23	17:41:23	EOL	Transetto_02	0176 - Transetto_02 - 0001.db	726821,96	4667918,08	42;07;50.02635N	11;44;39.56408E					
03/03/23	17:44:58	ROV is out of the water			726818,52	4667949,14	42;07;51.03571N	11;44;39.45801E					
03/03/23	17:45:22	ROV is on deck			726818,35	4667951,74	42;07;51.12007N	11;44;39.45398E					
03/03/23	17:58:01	USBL pole is elevated			726787,83	4667629,2	42;07;40.70618N	11;44;37.67525E					
03/03/23	17:58:03	Vessel start transit to Riva di Traiano port			726786,82	4667625,63	42;07;40.59163N	11;44;37.62608E					
03/03/23	18:37:52	Vessel moored			732494,82	4660834,06	42;03;54.63363N	11;48;36.22791E					
03/04/23	06:22:11	Vessel Start Transit to work area			732171,71	4661025,03	42;04;01.16194N	11;48;22.45801E					
03/04/23	08:31:21	SVP			705754,25	4663063,02	42;05;33.68142N	11;29;16.65356E					vessel in area. Waiting for good weather condifion
03/04/23	11:36:36	Vessel arrive to nearshore work area			726722,63	4667270,86	42;07;29.16877N	11;44;34.33735E					
03/04/23	11:37:10	USBL pole is lowered			726724,25	4667267,35	42;07;29.05335N	11;44;34.40280E					
03/04/23	11:37:18	SVP			726724,79	4667266,44	42;07;29.02347N	11;44;34.42519E					
03/04/23	12:00:34	ROV is off deck			727049,33	4667365,26	42;07;31.88573N	11;44;48.68227E					
03/04/23	12:01:02	ROV is in the water			727052,39	4667358,87	42;07;31.67550N	11;44;48.80672E					
03/04/23	12:05:25	SOL	Transetto_03	0177 - Transetto_03 - 0001.db	727027,87	4667362,34	42;07;31.81366N	11;44;47.74464E					
03/04/23	13:19:18	EOL	Transetto_03	0178 - Transetto_03 - 0001.db	727082,41	4667547,74	42;07;37.76114N	11;44;50.37697E					ROV problem
03/04/23	13:32:05	ROV is out of the water			727176,95	4667530,57	42;07;37.10633N	11;44;54.46603E					
03/04/23	13:32:18	ROV is on deck			727182,47	4667523,44	42;07;36.86959N	11;44;54.69605E					
03/04/23	14:25:09	USBL pole is elevated			727051,17	4667640,48	42;07;40.79698N	11;44;49.14783E					
03/04/23	14:25:24	Stop ops due bad weather conditions			727049,48	4667642,79	42;07;40.87370N	11;44;49.07742E					
03/04/23	14:26:05	Vessel start transit to Riva di Traiano port			727045,14	4667661,53	42;07;41.48515N	11;44;48.91484E					
03/04/23	15:14:12	Vessel moored			732493,31	4660833,89	42;03;54.62953N	11;48;36.16198E					
03/05/23	06:05:41	Vessel Start Transit to work area			732205,95	4661031,17	42;04;01.32446N	11;48;23.95460E					
03/05/23	08:05:46	Vessel arrive to work area			705868,86	4663337,15	42;05;42.45299N	11;29;21.98545E					
03/05/23	08:06:28	USBL pole is lowered			705872,16	4663328,86	42;05;42.18143N	11;29;22.11850E					
03/05/23	08:20:18	SVP			705969,38	4663215,55	42;05;38.41913N	11;29;26.20306E					
03/05/23	08:27:25	ROV is off deck			705824,72	4663327,42	42;05;42.17942N	11;29;20.05329E					
03/05/23	08:27:27	ROV is in the water			705824,84	4663327,49	42;05;42.18154N	11;29;20.05863E					
03/05/23	08:37:46	SOL	Transetto_09	0178 - Transetto_09 - 0001.db	705823,49	4663319,7	42;05;41.93068N	11;29;19.99022E					Prima passata SW-NE
03/05/23	08:44:54	EOL	Transetto_09	0179 - Transetto_09 - 0001.db	705834,35	4663323,39	42;05;42.03971N	11;29;20.46696E					
03/05/23	08:48:11	SOL	Transetto_09	0179 - Transetto_09 - 0001.db	705829,75	4663327,59	42;05;42.18021N	11;29;20.27233E					Seconda passata NE-SW
03/05/23	08:55:52	EOL	Transetto_09	0180 - Transetto_09 - 0001.db	705850,88	4663320,66	42;05;41.93583N	11;29;21.18276E					
03/05/23	08:59:16	SOL	Transetto_08	0180 - Transetto_08 - 0001.db	705868,7	4663316,69	42;05;41.79034N	11;29;21.95280E					Prima passata SW-NE
03/05/23	09:02:52	EOL	Transetto_08	0181 - Transetto_08 - 0001.db	705881,61	4663305,2	42;05;41.40610N	11;29;22.49957E					Interrotto
03/05/23	09:18:47	SOL	Transetto_08	0181 - Transetto_08 - 0001.db	705807,9	4663359,9	42;05;43.24739N	11;29;19.36324E					Rerun Prima passata SW-NE
03/05/23	09:28:35	EOL	Transetto_08	0182 - Transetto_08 - 0001.db	705820,66	4663383,82	42;05;44.01014N	11;29;19.94838E					
03/05/23	09:31:22	SOL	Transetto_08	0182 - Transetto_08 - 0001.db	705831,25	4663383,9	42;05;44.00299N	11;29;20.40898E					Seconda passata NE-SW

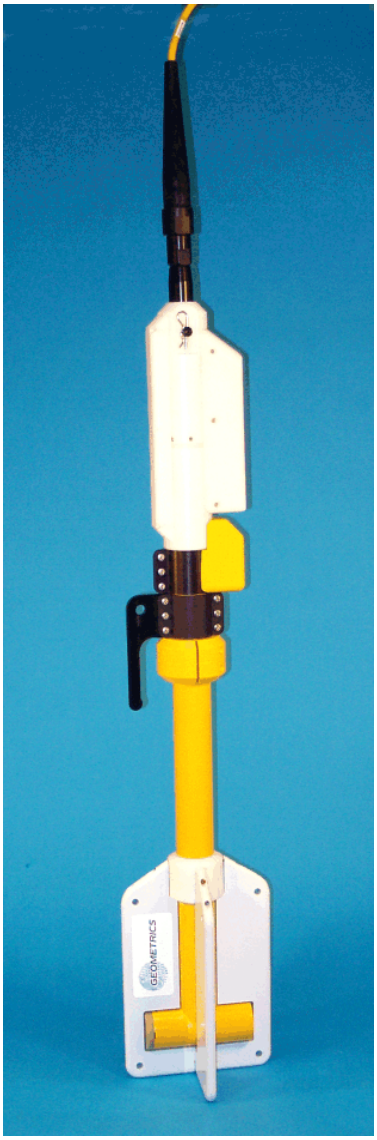
03/05/23	09:37:50	EOL	Transetto_08	0183 - Transetto_08 - 0001.db	705799,57	4663342,69	42;05;42.69798N	11;29;18.97915E					
03/05/23	09:46:14	SOL	Transetto_08	0183 - Transetto_08 - 0001.db	705835,46	4663359,75	42;05;43.21673N	11;29;20.56148E					Rerun Seconda passata NE-SW
03/05/23	09:57:43	EOL	Transetto_08	0184 - Transetto_08 - 0001.db	705826,53	4663371,8	42;05;43.61530N	11;29;20.18855E					
03/05/23	10:01:57	SOL	Transetto_07	0184 - Transetto_07 - 0001.db	705821,84	4663363,46	42;05;43.34971N	11;29;19.97389E					Prima passata SW-NE
03/05/23	10:02:33	EOL	Transetto_07	0185 - Transetto_07 - 0001.db	705825,8	4663367,06	42;05;43.46252N	11;29;20.15083E					Aborted due camera problem
03/05/23	10:09:59	SOL	Transetto_07	0185 - Transetto_07 - 0001.db	705811,94	4663355,12	42;05;43.08892N	11;29;19.53253E					Rerun Prima passata SW-NE
03/05/23	10:17:45	EOL	Transetto_07	0186 - Transetto_07 - 0001.db	705834,11	4663349,91	42;05;42.89913N	11;29;20.49046E					Stop due USBL problem
03/05/23	10:23:11	ROV HD Camera problem	Transetto_07	0186 - Transetto_07 - 0001.db	705821,42	4663351,36	42;05;42.95810N	11;29;19.94016E					
03/05/23	10:27:02	SOL	Transetto_07	0186 - Transetto_07 - 0001.db	705816,64	4663363,58	42;05;43.35855N	11;29;19.74799E					Secondo Rerun prima passata SW-NE
03/05/23	10:32:58	EOL	Transetto_07	0187 - Transetto_07 - 0001.db	705840,85	4663356,99	42;05;43.12210N	11;29;20.79241E					
03/05/23	10:35:26	SOL	Transetto_03	0187 - Transetto_03 - 0001.db	705838,48	4663376,42	42;05;43.75357N	11;29;20.71382E					Prima passata SE-NW
03/05/23	10:40:41	EOL	Transetto_03	0188 - Transetto_03 - 0001.db	705821,98	4663386,16	42;05;44.08488N	11;29;20.00864E					
03/05/23	10:43:41	SOL	Transetto_02	0188 - Transetto_02 - 0001.db	705815,68	4663364,52	42;05;43.38977N	11;29;19.70717E					Prima passata NW-SE
03/05/23	10:50:58	EOL	Transetto_02	0189 - Transetto_02 - 0001.db	705847,19	4663349,12	42;05;42.86104N	11;29;21.05816E					
03/05/23	10:55:37	SOL	Transetto_01	0189 - Transetto_01 - 0001.db	705822,92	4663368,6	42;05;43.51509N	11;29;20.02745E					Prima passata SE-NW
03/05/23	11:03:04	EOL	Transetto_01	0190 - Transetto_01 - 0001.db	705828,76	4663370,61	42;05;43.57460N	11;29;20.28380E					
03/05/23	11:10:12	SOL	Transetto_01	0190 - Transetto_01 - 0001.db	705828,5	4663376,92	42;05;43.77929N	11;29;20.28071E					Seconda passata NW-SE
03/05/23	11:23:45	EOL	Transetto_01	0191 - Transetto_01 - 0001.db	705822,06	4663366,71	42;05;43.45466N	11;29;19.98751E					
03/05/23	11:29:42	SOL	Transetto_06	0191 - Transetto_06 - 0001.db	705819,51	4663370,84	42;05;43.59091N	11;29;19.88170E					Prima passata SE-NW
03/05/23	11:35:23	EOL	Transetto_06	0192 - Transetto_06 - 0001.db	705818,06	4663368,61	42;05;43.51988N	11;29;19.81595E					
03/05/23	11:38:50	SOL	Transetto_06	0192 - Transetto_06 - 0001.db	705807,4	4663380,18	42;05;43.90489N	11;29;19.36683E					Seconda passata NW-SE
03/05/23	11:48:41	EOL	Transetto_06	0193 - Transetto_06 - 0001.db	705830,74	4663362,58	42;05;43.31272N	11;29;20.35961E					
03/05/23	12:00:46	SOL	Ispection Around	0193 - Ispection Around - 0001.db	705830,58	4663374,35	42;05;43.69399N	11;29;20.36773E					Stop due bad visibility
03/05/23	12:06:04	EOL	Ispection Around	0193 - Ispection Around - 0001.db	705816,16	4663371,02	42;05;43.59998N	11;29;19.73656E					
03/05/23	12:10:27	SOL	Ispection Around	0194 - Ispection Around - 0001.db	705843,97	4663365,31	42;05;43.38867N	11;29;20.93885E					
03/05/23	12:29:29	EOL	Ispection Around	0195 - Ispection Around - 0001.db	705812,66	4663375,13	42;05;43.73627N	11;29;19.58927E					
03/05/23	12:38:53	ROV is out of the water			705986,51	4663358,35	42;05;43.02866N	11;29;27.12917E					
03/05/23	12:39:01	ROV is on deck			705989,55	4663358,31	42;05;43.02457N	11;29;27.26155E					
03/05/23	12:43:23	USBL pole is elevated			706084,71	4663373,37	42;05;43.42231N	11;29;31.41921E					
03/05/23	12:43:33	Vessel Start Transit to work area (nearshore)			706092,14	4663386,44	42;05;43.83880N	11;29;31.75925E					
03/05/23	14:09:23	USBL pole is lowered			726794,55	4667345,24	42;07;31.50269N	11;44;37.57022E					
03/05/23	14:09:26	SVP			726794,71	4667345,73	42;07;31.51859N	11;44;37.57806E					
03/05/23	14:22:39	ROV is off deck	Transetto_03	0195 - Transetto_03 - 0001.db	726970,26	4667601,64	42;07;39.62365N	11;44;45.57345E					
03/05/23	14:23:01	ROV is in the water	Transetto_03	0195 - Transetto_03 - 0001.db	726971,18	4667603,09	42;07;39.66962N	11;44;45.61520E					
03/05/23	14:32:05	SOL	Transetto_03	0195 - Transetto_03 - 0001.db	726998,34	4667590,38	42;07;39.22958N	11;44;46.77904E					
03/05/23	14:57:58	EOL	Transetto_03	0196 - Transetto_03 - 0001.db	727094,17	4667689,39	42;07;42.33615N	11;44;51.08702E					
03/05/23	15:00:54	ROV is out of the water	Transetto_03	0196 - Transetto_03 - 0001.db	727066,95	4667676,4	42;07;41.94379N	11;44;49.88445E					
03/05/23	15:01:04	ROV is on deck	Transetto_03	0196 - Transetto_03 - 0001.db	727059,89	4667673,01	42;07;41.84151N	11;44;49.57250E					
03/05/23	15:04:49	USBL pole is elevated			726892,26	4667564,28	42;07;38.49488N	11;44;42.12778E					
03/05/23	15:04:55	Vessel start transit to Riva di Traiano port			726896,1	4667546,43	42;07;37.91260N	11;44;42.26976E					
03/05/23	15:48:43	Vessel moored - Start ROV Demob ops			732493,25	4660834,52	42;03;54.65003N	11;48;36.16041E					
03/05/23	17:11:43	End ROV demob ops			732493,25	4660834,52	42;03;54.65003N	11;48;36.16041E					
03/07/23	08:39:29	Vessel Start Transit to work area			732502,2	4660843,45	42;03;54.92977N	11;48;36.56210E					
03/07/23	09:21:21	Vessel start transit to Riva di Traiano port			730527,07	4661165,55	42;04;07.45573N	11;47;11.17615E					Bad weather condition
03/07/23	09:32:48	Vessel moored			732493,33	4660834,6	42;03;54.65269N	11;48;36.16396E					
03/12/23	10:00:21	Vessel Start Transit to work area			732506,28	4660859,41	42;03;55.44236N	11;48;36.76225E					
03/12/23	10:54:11	SOL	TWE_G06_50m	0196 - TWE_G06_50m - 0001.db	725692,27	4666588,75	42;07;08.14743N	11;43;48.56279E	725677,92	4666584,58	42;07;08.02743N	11;43;47.93308E	
04/12/23	10:56:00	S	TWE_G06_50m	195 - TWE_G06_50m - 0001.db					725734,52	4666581,42	42;07;23.91467N	11;44;11.30712E	
03/12/23	11:38:39	R01	TWE_G06_50m	0196 - TWE_G06_50m - 0001.db	725717,61	4666570,09	42;07;07.51708N	11;43;49.63923E	725724,81	4666583,16	42;07;07.93292N	11;43;49.97090E	
03/12/23	12:02:12	R2	TWE_G06_50m	0196 - TWE_G06_50m - 0001.db	725715,62	4666577,66	42;07;07.76403N	11;43;49.56331E	725727,53	4666586,66	42;07;08.04334N	11;43;50.09377E	
03/12/23	12:02:42	EOL	TWE_G06_50m	0197 - TWE_G06_50m - 0001.db	725710,91	4666566	42;07;07.39134N	11;43;49.34224E	725716,06	4666580,03	42;07;07.84050N	11;43;49.58578E	
03/12/23	14:50:58	SOL	TWE_G05_45m	0197 - TWE_G05_45m - 0001.db	726187,91	4667136,16	42;07;25.36230N	11;44;10.88702E	726176,82	4667126,13	42;07;25.04877N	11;44;10.39043E	
03/12/23	14:54:52	S	TWE_G05_45m	0197 - TWE_G05_45m - 0001.db	726213,3	4667088,68	42;07;23.79800N	11;44;11.92528E	726198,42	4667090,28	42;07;23.86533N	11;44;11.28027E	
03/12/23	15:22:25	R1	TWE_G05_45m	0197 - TWE_G05_45m - 0001.db	726199,39	4667074,18	42;07;23.34291N	11;44;11.29973E	726202,01	4667088,9	42;07;23.81706N	11;44;11.43450E	
03/12/23	15:36:45	R2	TWE_G05_45m	0197 - TWE_G05_45m - 0001.db	726193,93	4667077,77	42;07;23.46499N	11;44;11.06731E	726198,99	4667091,82	42;07;23.91467N	11;44;11.30712E	
03/12/23	15:52:52	EOL	TWE_G05_45m	0198 - TWE_G05_45m - 0001.db	727320,18	4665576,02	42;06;33.65717N	11;44;57.95843E	727310,71	4665587,57	42;06;34.04098N	11;44;57.56306E	
03/12/23	15:52:55	Vessel start transit to Riva di Traiano port											
03/12/23	16:48:50	Vessel moored											
13/03/2023	05:34:42	Vessel Start Transit to work area											
13/03/2023	06:42:08	SOL	TWE_G09_71m	0198 - TWE_G09_71m - 0001.db	723423	4664187,37	42;05;52.71222N	11;42;06.54112E	723413,56	4664198,93	42;05;53.09623N	11;42;06.14651E	
13/03/2023	07:03:09	S	TWE_G09_71m	0198 - TWE_G09_71m - 0001.db	723469,34	4664147,29	42;05;51.36657N	11;42;08.50107E	723455,35	4664152,62	42;05;51.55363N	11;42;07.90018E	Primo tentativo. Benna vuota
13/03/2023	07:18:57	S/R1	TWE_G09_71m	0198 - TWE_G09_71m - 0001.db	723463,32	4664153,02	42;05;51.55829N	11;42;08.24724E	723448,47	4664154,3	42;05;51.61481N	11;42;07.60309E	
13/03/2023	07:43:13	R2	TWE_G09_71m	0198 - TWE_G09_71m - 0001.db	723460,77	4664154,92	42;05;51.62241N	11;42;08.13905E	723446,39	4664151,09	42;05;51.51327N	11;42;07.50837E	
13/03/2023	07:51:15	EOL	TWE_G09_71m	0199 - TWE_G09_71m - 0001.db	723309,53	4664550,86	42;06;04.60078N	11;42;02.10643E	723323,02	4664544,53	42;06;04.38193N	11;42;02.68423E	
13/03/2023	08:25:10	SOL	TWE_G10_70m	0199 - TWE_G10_70m - 0001.db	722497,86	4666050,29	42;06;53.99335N	11;41;28.86244E	722509,09	4666060,13	42;06;54.30061N	11;41;29.36422E	
13/03/23	08:33:20	S/R1	TWE_G10_70m	0199 - TWE_G10_70m - 0001.db	722362,52	4665910,68	42;06;49.60996N	11;41;22.78377E	722369,84	4665923,7	42;06;50.02417N	11;41;23.12015E	
13/03/2023	08:58:19	R2	TWE_G10_70m	0199 - TWE_G10_70m - 0001.db	722385,8	4665913,89	42;06;49.69036N	11;41;23.80103E	722372,18	4665919,89	42;06;49.89846N	11;41;23.21653E	
13/03/2023	09:06:23	EOL	TWE_G10_70m	0200 - TWE_G10_70m - 0001.db	722306,55	4666225,03	42;06;59.84826N	11;41;20.77974E	722301,91	4666210,88	42;06;59.39445N	11;41;20.55870E	
13/03/2023	09:38:44	SOL	TWE_G07_58m	0200 - TWE_G07_58m - 0001.db	724032	4666372,75	42;07;02.86545N	11;42;36.04085E	724024,99	4666385,92	42;07;03.29896N	11;42;35.75409E	
13/03/2023	09:40:48	S/R1	TWE_G07_58m	0200 - TWE_G07_58m - 0001.db	724072,1	4666291,38	42;07;00.18886N	11;42;37.67318E	724071,46	4666306,29	42;07;00.67219N	11;42;37.66577E	
13/03/2023	09:52:16	R2	TWE_G07_58m	0200 - TWE_G07_58m - 0001.db	724074,9	4666294,73	42;07;00.29430N	11;42;37.79937E	724073,06	4666309,54	42;07;00.77592N	11;42;37.74000E	
13/03/2023	09:58:30	EOL	TWE_G07_58m	0201 - TWE_G07_58m - 0001.db	723999,3	4666504,76	42;07;07.17445N	11;42;34.80065E	724011,96	4666512,73	42;07;07.41949N	11;42;35.36251E	
13/03/2023	10:34:04	SOL	TWE_G08_57m	0201 - TWE_G08_57m - 0001.db	724733,42	4665490,58	42;06;33.57249N	11;43;05.33122E	724747,47	4665495,73	42;06;33.72473N	11;43;05.94947E	
13/03/2023	10:39:39	S/R1	TWE_G08_57m	0201 - TWE_G08_57m - 0001.db	724614,44	4665408,43	42;06;31.03447N	11;43;00.04251E	724627,07	4665416,48	42;06;31.28220N	11;43;00.60305E	
13/03/2023	11:06:08	R2	TWE_G08_57m	0201 - TWE_G08_57m - 0001.db	724644,14	4665410,77	42;06;31.07957N	11;43;01.33737E	724629,42	4665413,27	42;06;31.17558N	11;43;00.70077E	
13/03/2023	11:12:52	EOL	TWE_G08_57m	0202 - TWE_G08_57m - 0001.db	724595,16	4665665,54	42;06;39.38119N	11;42;59.55970E	724587,98	4665652,48	42;06;38.96566N	11;42;59.22932E	
13/03/2023	11:40:25	SOL	TWE_G04_45m	0202 - TWE_G04_45m - 0001.db	726015,85	4667279,72	42;07;30.19023N	11;44;03.60158E	726000,90	4667279,77	42;07;30.20720N	11;44;02.95124E	
13/03/2023	11:45:17	S/R1	TWE_G04_45m	0202 - TWE_G04_45m - 0001.db	726222,44	4667152,24	42;07;25.84712N	11;44;12.41145E	726209,63	4667144,57	42;07;25.61187N	11;44;11.84347E	
13/03/2023	12:00:01	R2_A	TWE_G04_45m	0202 - TWE_G04_45m - 0001.db	726189,41	4667141,29	42;07;25.52680N	11;44;10.95919E	726201,99	4667149,41	42;07;25.77653N	11;44;11.51783E	Benna vuota
13/03/2023	12:08:41	R2_B	TWE_G04_45m	0202 - TWE_G04_45m - 0001.db	726218,14	4667141,13	42;07;25.49162N	11;44;12.20897E	726208,71	4667152,72	42;07;25.87671N	11;44;11.81497E	Benna vuota
13/03/2023	12:18:36	R2_C	TWE_G04_45m	0202 - TWE_G04_45m - 0001.db	726201,05	4667165,87	42;07;26.31085N	11;44;11.49978E	726207,88	4667152,59	42;07;25.87357N	11;44;11.77861E	Benna vuota
13/03/2023	12:24:09	EOL	TWE_G04_45m	0203 - TWE_G04_45m - 0001.db	726160,92	4667387,36	42;07;33.52548N	11;44;10.06291E	726149,56	4667377,72	42;07;33.22527N	11;44;09.55553E	
13/03/2023	12:28:50	SOL	TWE_G03_40m	0203 - TWE_G03_40m - 0001.db	726477,11	4667546,46	42;07;38.34971N	11;44;24.04136E	726462,23	4667546,87	42;07;38.37836N	11;44;23.39423E	
13/03/2023	12:40:23	S/R1	TWE_G03_40m	0203 - TWE_G03_40m - 0001.db	726519,12	4667469,46	42;07;35.81216N	11;44;25.76148E	726505,59	4667475,77	42;07;36.03085N	11;44;25.18155E	Benna vuota
13/03/2023	12:47:13	S/R1_A	TWE_G03_40m	0203 - TWE_G03_40m - 0001.db	726516,01	4667455,26	42;07;35.35575N	11;44;25.60620E	726504,29	4667464,56	42;07;35.66895N	11;44;25.10939E	
13/03/2023	12:58:48	R2	TWE_G03_40m	0203 - TWE_G03_40m - 0001.db	726518,32	4667473,4	42;07;35.94061N	11;44;25.73210E	726503,47	4667475,22	42;07;36.01521N	11;44;25.08849E	
13/03/2023	13:03:29	EOL	TWE_G03_40m	0203 - TWE_G03_40m - 0001.db	726486,36	4667598,78	42;07;40.03470N	11;44;24.51661E	726476,89	4667587,24	42;07;39.67071N	11;44;24.08834E	
13/03/2023	13:06:34	SOL	TWE_G01_25m	0204 - TWE_G01_25m - 0001.db	726695,56	4667791,78	42;07;46.06744N	11;44;33.88815E	726681,39	4667787,23	42;07;45.93483N	11;44;33.26531E	
13/03/23	13:11:11	S_R1	TWE_G01_25m	0204 - TWE_G01_25m - 0001.db	726809,37	4667773,86	42;07;45.36852N	11;44;38.81461E	726794,44	4667772,98	42;07;45.35566N	11;44;38.16383E	Benna vuota
13/03/2023	13:18:37	S_R1_A	TWE_G01_25m	0204 - TWE_G01_25m - 0001.db	726807,63	4667765,43	42;07;45.09733N	11;44;38.72687E	726800,88	4667778,75	42;07;45.53588N	11;44;38.45221E	Benna vuota
13/03/2023	13:22:31	EOL	TWE_G01_25m	0205 - TWE_G01_25m - 0001.db	726719,76	4667854,27	42;07;48.06616N	11;44;35.02840E	726729,03	4667865,89	42;07;48.43261N	11;44;35.44791E	
13/03/2023	13:22:39	SOL	TWE_G02_35m	0205 - TWE_G02_35m - 0001.db	726714,66	4667850,65	42;07;47.95398N	11;44;34.80124E	726718,39	4667865,11	42;07;48.41867N	11;44;34.98384E	
13/03/2023	13:26:19	S_R1	TWE_G02_35m	0205 - TWE_G02_35m - 0001.db	726700,57	4667606,35	42;07;40.05688N	11;44;33.84656E	726688,36	4667614,95	42;07;40.34806N	11;44;33.32774E	
13/03/2023	13:38:01	R2	TWE_G02_35m	0205 - TWE_G02_35m - 0001.db	726699,3	4667609,95	42;07;40.17475N	11;44;33.79663E	726686,23	4667617,14	42;07;40.42121N	11;44;33.23804E	
13/03/2023	13:43:19	EOL	TWE_G02_35m	0206 - TWE_G02_35m - 0001.db	726657,73	4667727,17	42;07;44.01424N	11;44;32.15171E	726642,90	4667725,62	42;07;43.97960N	11;44;31.50423E	
13/03/2023	13:48:39	Vessel start transit to Riva di Traiano port	TWE_G02_35m	0206 - TWE_G02_35m - 0001.db	726692,75	4667380,39	42;07;32.74698N	11;44;33.19072E	726686,20	4667393,79	42;07;33.18802N	11;44;32.92427E	
13/03/2023	14:59:24	Vessel moored	Riva di Traiano PORT	0206 - Riva di Traiano PORT - 0001.db	732493,24	4660833,82	42;03;54.62740N	11;48;36.15890E	732478,34	4660832,77	42;03;54.60920N	11;48;35.50997E	

Appendix B

Equipment

G-882 MARINE MAGNETOMETER

- ***CESIUM VAPOR HIGH PERFORMANCE – Highest detection range and probability of detecting all sized ferrous targets***
- ***NEW STREAMLINED DESIGN FOR TOW SAFETY – Low probability of fouling in lines or rocks***
- ***NEW QUICK CONVERSION FROM NOSE TOW TO CG TOW – Simply remove an aluminum locking pin, move tow point and reinsert. New built in easy carry handle!***
- ***NEW INTERNAL CM-221 COUNTER MODULE – Provides Flash Memory for storage of default parameters set by user***
- ***NEW ECHOSOUNDER / ALTIMETER OPTION***
- ***NEW DEPTH RATING – 4,000 psi !***
- ***HIGHEST SENSITIVITY IN THE INDUSTRY – 0.004 nT/√Hz RMS with the internal CM-221 Mini-Counter***
- ***EASY PORTABILITY & HANDLING – no winch required, single man operation, only 44 lbs with 200 ft cable (without weights)***
- ***COMBINE TWO SYSTEMS FOR INCREASED COVERAGE – Internal CM-221 Mini-Counter provides multi-sensor data concatenation allowing side by side coverage which maximizes detection of small targets and reduces noise***



G-882 with Weight Collar Depth Option & Altimeter

Very high resolution Cesium Vapor performance is now available in a low cost, small size system for professional surveys in shallow or deep water. High sensitivity and sample rates are maintained for all applications. The well proven Cesium sensor is combined with a unique and new CM-221 Larmor counter and ruggedly packaged for small or large boat operation. Use your computer and standard printer with our MagLogLite™ software to log, display and print GPS position and magnetic field data. The G–882 is the lowest priced high performance full range marine magnetometer system ever offered.

The G-882 offers flexibility for operation from small boat, shallow water surveys as well as deep tow applications (4,000 psi rating, telemetry over steel coax available to 10Km). The G-882 also directly interfaces to all major Side Scan manufacturers for tandem tow configurations. Being small and lightweight (44 lbs net, without weights) it is easily deployed and operated by one person. But add several streamlined weight collars and the system can quickly weigh more than 100 lbs. for deep tow applications. Power may be supplied from a 24 to 30 VDC battery power or the included 110/220 VAC power supply. The tow cable employs high strength Kevlar strain member with a standard length of 200 ft (61 m) and optional cable length up to 500m with no telemetry required.

A rugged fiber-wound fiberglass housing is designed for operation is all parts of the world allowing sensor rotation for work in equatorial regions. The shipboard end of the tow cable is attached to an included junction box or optional on-board cable for quick and simple hookup to power and output of data into any Windows 98, ME, NT, 2000 or XP computer equipped with RS-232 serial ports.

The G-882 Cesium magnetometer provides the same operating sensitivity and sample rates as the larger deep tow model G-880. MagLogLite™ Logging Software is offered with each magnetometer and allows recording and display of data and position with Automatic Anomaly Detection and automatic anomaly printing on Windows™ printer! Additional options include: MagMap2000 plotting and contouring software and post acquisition processing software MagPick™ (free from our website.)

The G-882 system is particularly well suited for the detection and mapping of all sizes of ferrous objects. This includes anchors, chains, cables, pipelines, ballast stone and other scattered shipwreck debris, munitions of all sizes (UXO), aircraft, engines and any other object with magnetic expression. Objects as small as a 5 inch screwdriver are readily detected provided that the sensor is close to the seafloor and within practical detection range. (Refer to table at right).

The design of this high sensitivity G-882 marine unit is directed toward the largest number of user needs. It is intended to meet all marine requirements such as shallow survey, deep tow through long cables, integration with Side Scan Sonar systems and monitoring of fish depth and altitude.

Typical Detection Range For Common Objects

Ship 1000 tons	0.5 to 1 nT at 800 ft (244 m)
Anchor 20 tons	0.8 to 1.25 nT at 400 ft (120 m)
Automobile	1 to 2 nT at 100 ft (30 m)
Light Aircraft	0.5 to 2 nT at 40 ft (12 m)
Pipeline (12 inch)	1 to 2 nT at 200 ft (60 m)
Pipeline (6 inch)	1 to 2 nT at 100 ft (30 m)
100 KG of iron	1 to 2 nT at 50 ft (15 m)
100 lbs of iron	0.5 to 1 nT at 30 ft (9 m)
10 lbs of iron	0.5 to 1 nT at 20 ft (6 m)
1 lb of iron	0.5 to 1 nT at 10 ft (3 m)
Screwdriver 5 inch	0.5 to 2 nT at 12 ft (4 m)
1000 lb bomb	1 to 5 nT at 100 ft (30 m)
500 lb bomb	0.5 to 5 nT at 50 ft (16 m)
Grenade	0.5 to 2 nT at 10 ft (3 m)
20 mm shell	0.5 to 2 nT at 5 ft (1.8 m)

MODEL G-882 CESIUM MARINE MAGNETOMETER SYSTEM SPECIFICATIONS

OPERATING PRINCIPLE:	Self-oscillating split-beam Cesium Vapor (non-radioactive)
OPERATING RANGE:	20,000 to 100,000 nT
OPERATING ZONES:	The earth's field vector should be at an angle greater than 6° from the sensor's equator and greater than 6° away from the sensor's long axis. Automatic hemisphere switching.
CM-221 COUNTER SENSITIVITY:	<0.004 nT/ √Hz rms. Up to 20 samples per second
HEADING ERROR:	±1 nT (over entire 360° spin)
ABSOLUTE ACCURACY:	<2 nT throughout range
OUTPUT:	RS-232 at 1,200 to 19,200 Baud
MECHANICAL:	
Sensor Fish:	Body 2.75 in. (7 cm) dia., 4.5 ft (1.37 m) long with fin assembly (11 in. cross width), 40 lbs. (18 kg) Includes Sensor and Electronics and 1 main weight. Additional collar weights are 14lbs (6.4kg) each, total of 5 capable
Tow Cable:	Kevlar Reinforced multiconductor tow cable. Breaking strength 3,600 lbs, 0.48 in OD, 200 ft maximum. Weighs 17 lbs (7.7 kg) with terminations.
OPERATING TEMPERATURE:	-30° F to +122°F (-35°C to +50°C)
STORAGE TEMPERATURE:	-48° F to +158°F (-45°C to +70°C)
ALTITUDE:	Up to 30,000 ft (9,000 m)
WATER TIGHT:	O-Ring sealed for up to 4,000 psi (9000 ft or 2750 m) depth operation
POWER:	24 to 32 VDC, 0.75 amp at turn-on and 0.5 amp thereafter
ACCESSORIES:	
Standard:	View201 Utility Software operation manual and ship kit
Optional:	Telemetry to 10Km coax, gradiometer (longitudinal or transverse), reusable shipping case
MagLog Lite™ Software:	Logs, displays and prints Mag and GPS data at 10 Hz sample rate. Automatic anomaly detection and single sheet Windows printer support

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE ***12/06***

GEOMETRICS INC. 2190 Fortune Drive, San Jose, California 95131, USA
Tel: 408-954-0522 – Fax: 408-954-0902 – Email: sales@geometrics.com

GEOMETRICS EUROPE 20 Eden Way, Pages Industrial Park, Leighton Buzzard LU7 4TZ, UK
Tel: 44-1525-383438 – Fax: 44-1525-382200 – Email: chris@georentals.co.uk

GEOMETRICS CHINA Laurel Technologies, Ste 1807-1810, Kun Tai Int'l Mansion, #12B, Chaowai St., Beijing 100020, China
Tel: 86-10-5879-0099 – Fax: 86-10-5879-0989 – Email: laurel@laureltech.com.cn

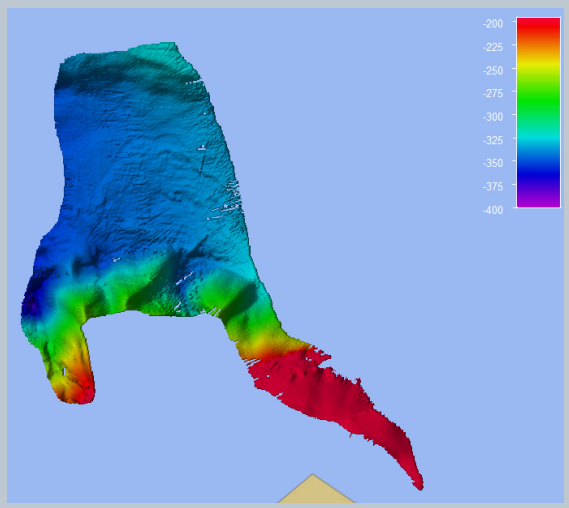
NORBIT WINGHEAD® B57S

Superior Performance Ultra High-Resolution 3D&4D Long Range Motion Stabilised Bathymetric System.

Designed to offer unsurpassed performance in shallow and medium water depths. This cylindrical ultra-high resolution curved array bathymetric system allows for rapid mobilisation anywhere anytime.

The NORBIT WINGHEAD platform is based on a state of the art analogue and digital technology featuring powerful signal processing capabilities ensuring the highest quality survey data performance. The sonar offers active roll and pitch stabilized bathymetry plus several imagery and backscatter as standard outputs. With broad R&D expertise, NORBIT has developed - from the ground-up - exciting new technology that allows existing and new applications to benefit from the advantages offered by a compact wideband curved-array multibeam sonar.

The Long Range WINGHEAD B57S sonar is a ultra-high resolution curved array broadband multibeam echosounder designed to operate in the most demanding environments. Characterised by compact form factor, low power draw and tight integration, WINGHEAD B57S is an optimal choice for surface vessels ranging from small USVs to large vessels and permanent hull mounts.



NORBIT SUBSEA | STIKLESTADVEIEN 1 | N-7041 TRONDHEIM | NORWAY | PHONE +47 73 98 25 50 | subsea@norbit.com

PS-210006-4

WINGHEAD B57S

NORBIT
- explore more -

Features

- ✓ Active Pitch and Roll Stabilisation
- ✓ Multibeam Sonar can be Integrated with Inertial Navigation System & Integrated NTRIP Client
- ✓ 40kHz Bandwidth
- ✓ Backscatter Outputs (Intensity, Sidescan, Snippet Sidescan, Snippets, Water Column)
- ✓ Multidetect
- ✓ Pipeline Mode
- ✓ Simple Ethernet Interface
- ✓ Integrated Sound Velocity Probe
- ✓ 1024 Dynamically Focused Beams
- ✓ FM & CW Processing
- ✓ Mounting Bracket Included
- ✓ Exceeds IHO *Special Order*, CHS *Exclusive Order* & USACE *New Work*

Applications

- ✓ USV Survey Platforms
- ✓ Mid Water Bathymetry
- ✓ Pipeline & Cable Pre Route Surveys
- ✓ Post installation pipeline & cable inspections
- ✓ Mineral and Geological Surveys
- ✓ Wreck and seabed Search and Investigation
- ✓ Oceanographic Research
- ✓ EEZ Surveys
- ✓ Coastal Surveys

Options

- ✓ Dual Head Configuration
- ✓ Sound Velocity Profiler
- ✓ Turnkey Survey Solutions
- ✓ Permanent Hull Mount Option
- ✓ Pole Mount
- ✓ Supports NORBIT iLiDAR
- ✓ 19Inch Rack Mount, Top Side
- ✓ Acquisition, Navigation and Post Processing Software
- ✓ Senior Hydrographer for Support and Training
- ✓ Can be Delivered with Software Packages e.g. HYPACK, Qinsy, EIVA, CARIS and Others

TECHNICAL SPECIFICATION

SWATH COVERAGE	5-210° FLEXIBLE SECTOR
RANGE RESOLUTION	<20mm ACOUSTIC w. 40kHz BANDWIDTH
NUMBER OF BEAMS	256, 512, 1024 EA & ED
OPERATING FREQUENCY	NOMINAL FREQUENCY 100kHz (FREQUENCY AGILITY 70-240kHz)
DEPTH RANGE	0.2m to 1200m a) EXTINCTION RANGE >1,250m b) SWATH COVERAGE ~1,000m @ 200m WD c) SWATH COVERAGE ~600m @ 100m WD
PING RATE	UP TO 60Hz, ADAPTIVE
RESOLUTION (ACROSS X ALONG)	STANDARD: 2° X 2° @100kHz 1° X 1° @200kHz
INTERFACE	ETHERNET & SERIAL
POWER CONSUMPTION	TYPICAL <95W (10-28VDC, 110-240VAC) TOTAL SYSTEM POWER CONSUMPTION
DIMENSIONS	DIMENSIONS: H: 447mm/17.59", L: 570.0mm/22.44", W: 147mm/5.78"
WEIGHT	18kg (AIR) 10.2kg (WATER)
CABLE LENGTH	STD 8m, OPTIONAL: 25m and 40m
OPERATING TEMP.	-4°C to +40°C (TOPSIDE -20°C to +55°C)
STORGAGE TEMP.	-20°C to +60°C
ENVIRONMENTAL	TOPSIDE: IP67: DUST TIGHT, PROTECTED AGAINST THE EFFECT OF IMMERSION UP TO 1m WET-END (SONAR): 100m

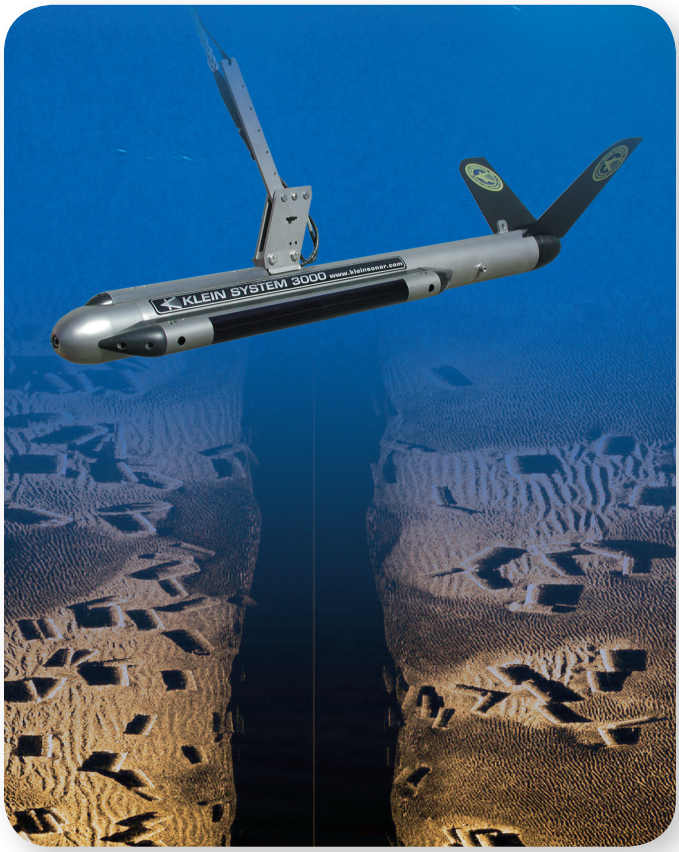
OUTLINE DRAWING

SYSTEM 3000 SIDE SCAN SONAR

DUAL-FREQUENCY SINGLE BEAM SONAR

Digital Side Scan Sonar:

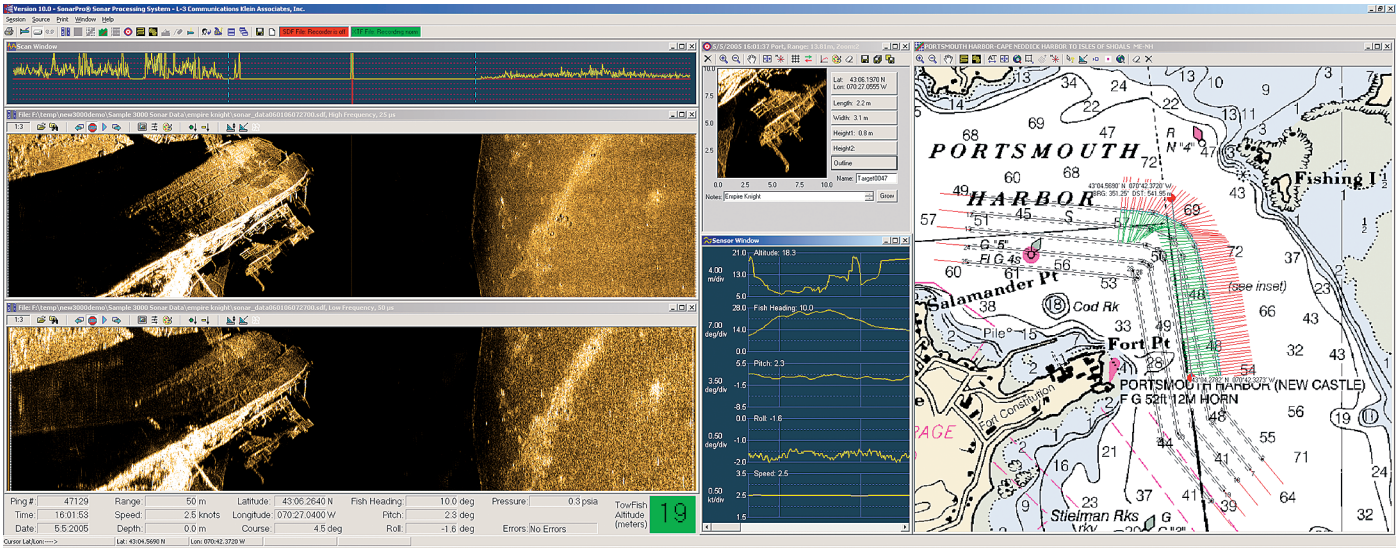
The Klein System 3000 presents the latest technology in digital side scan sonar imaging. The simultaneous dual-frequency operation is based on new transducer designs, as well as the high-resolution circuitry recently developed for the Klein multi-beam focused sonar. The System 3000 performance and price is directed to the commercial, institutional and governmental markets.



Key Features:

- Advanced signal processing and transducers produce superior imagery
- Cost-effective, affordable
- PC-based operation with SonarPro® software, dedicated to Klein sonars
- Small, lightweight and simple designs - easy to run and maintain
- Easily adapted to ROV's and custom towfish
- Meets IHO & NOAA Survey specifications

The Difference Is In The Image



SYSTEM 3000 SIDE SCAN SONAR

DUAL-FREQUENCY SINGLE BEAM SONAR

Specifications:

System 3000 Towfish	
Frequencies	100 kHz (132 kHz, ± 1% actual) 500 kHz (445 kHz, ± 1% actual)
Transmission Pulse	Tone burst, operator-selectable from 25 to 400 µsecs; Independent pulse controls for each frequency
Beams	Horizontal: 0.7° @ 100 kHz 0.21° @ 500 kHz Vertical: 40°
Beam Tilt	5°, 10°, 15°, 20°, 25° down, adjustable
Range Scales	15 settings - 25 to 1,000 meters
Maximum Range	600 m @ 100 kHz 150 m @ 500 kHz
Depth Rating	1,500 m standard; other options available
Construction	Stainless Steel
Body Length	122 cm (48 in)
Body Diameter	8.9 cm (3.5 in)
Weight	29 kg (63.9 lbs) in air
Standard Sensors	Roll, Pitch, Heading
Options	Magnetometer, pressure sensor, acoustic positioning, sub-bottom profiler

Transceiver Processor Unit (TPU)	
Operating System	VxWorks® with custom application
Basic Hardware	Splash-Proof 2 (SP2) TPU
Outputs	100 Base-Tx, Ethernet LAN
Navigation Input	NMEA 0183
Power	120 watts @ 120/240 VAC, 50/60 Hz (includes towfish)
Interfacing	Interfaces to all major sonar data processors
Options	19-in rack mount TPU

Tow Cable
Klein offers a selection of coaxial, Kevlar® reinforced, lightweight cables, and interfaces to fiber optic cables. All cables come fully terminated at the towfish end.

Klein Sonar Workstation	
Operating System	Windows
Sonar Software	SonarPro®
Data Format	SDF or XTF or both, selectable
Data Storage	Internal Hard Drive, CD/DVD-RW
Hardware	Industrial PC
Options	Optional Waterproof Laptops

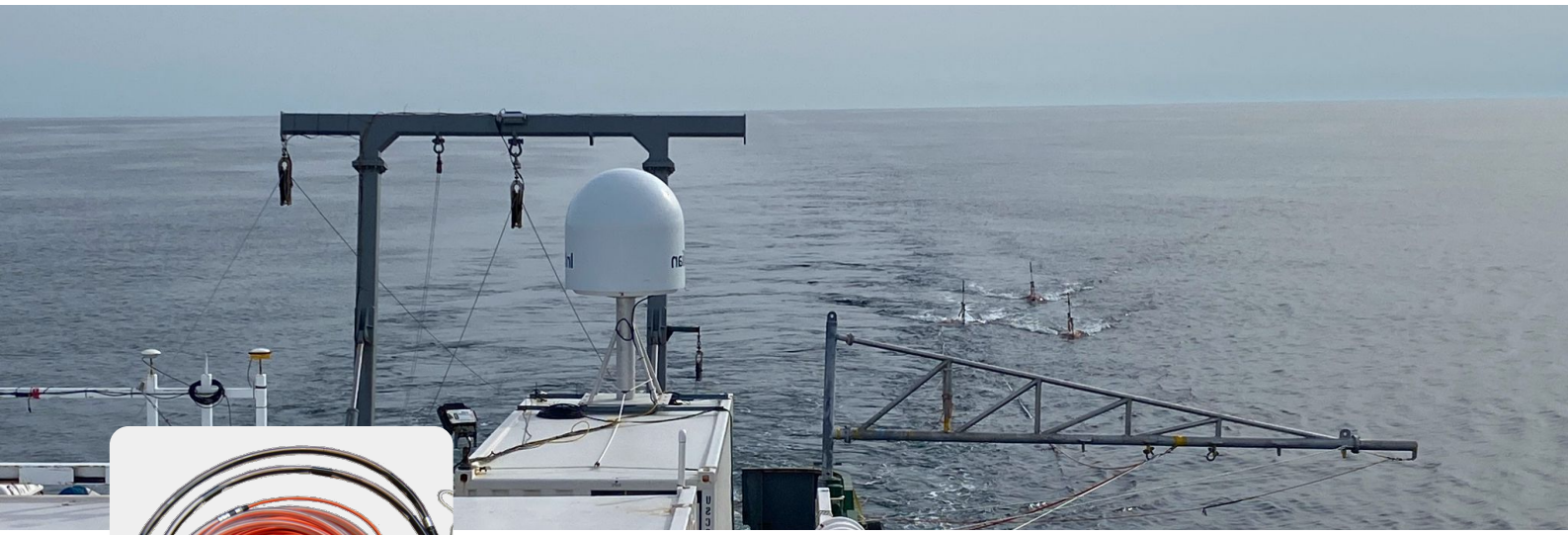
SonarPro® Software	
Custom-developed software by users and for users of Klein Side Scan Sonar Systems operating on Windows 7. Field-proven for many years. SonarPro® is a modular package combining ease of use with advanced sonar features.	
Basic Modules	Main program, data display, information, target management, navigation, data recording & playing, and sensor display.
Multiple Display Windows	Permits multiple windows to view different features as well as targets in real-time or in playback modes. Multi-windows for sonar channels, navigation, sensors, status monitors, targets, etc.
Survey Design	Quick and easy survey set up with ability to change parameters, set tolerances, monitor actual coverage and store settings.
Target Management	Independant windows permitting mensuration, logging, comparisons, filing, classification, positioning, time & survey target layers, and feature enhancements. Locates target in navigation window.
Sensor Window	Displays all sensors in several formats (includes some alarms) and responder set up to suit many frequencies and ping rates.
Networking	Permits multiple, real time processing workstations via a LAN including “master and slave” configurations.
“Wizards”	To help operator set up various manual and default parameters.
Data Comparisons Real Time	Target and route comparisons to historical data.

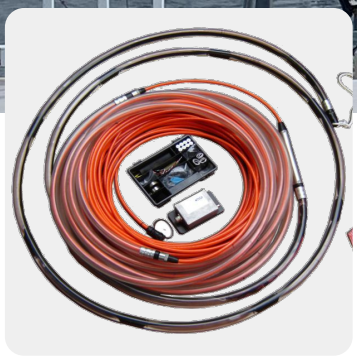
KLEIN *MARINE SYSTEMS, INC.*
11 Klein Drive • Salem, New Hampshire 03079
Tel: 603.893.6131 • Fax: 603.893.8807 • Email: sales@kleinmarinesystems.com
www.kleinmarinesystems.com

MARINE SURVEY SYSTEMS

Geo-Sense Mini-Streamers

ULTRA HIGH-RESOLUTION STREAMERS





High quality and versatile Single-Channel Streamer with arrays of 8 to 24+ elements.

Description

APPLICATION AND COMPATIBILITY
The Geo-Sense Mini-Streamers are a robust and versatile option for single-channel seismic operations from very shallow to deep water (the short 8-element array was successfully used in 4500 m water depths). They are specifically designed to capture the high frequency spectrum emitted by our sparker and boomer sources, but can also be used to capture the signal of LF sources, such as air guns and water guns and can be interfaced with any third party recording system.

DESIGN
Geo-Sense Mini-Streamers have the standard 30 cm separation between elements and the 8 and 24 elements versions. However, The active length and number of elements can be configured to your requirements.

AQ-2000 HYDROPHONES
The AQ-2000 allows a stable performance over a wide range of water depths. It has excellent acceleration-cancelling qualities and an exceptionally wide frequency bandwidth. The AQ-2000 can be installed into standard array configurations or integrated into custom-moulded packages. Every hydrophone is tested for sensitivity, capacitance and insulation to ensure the highest quality product for all very high resolution seismic operations.

Operational Features

→ Can be employed in small and large vessel operation.

→ Can be handled by one person.

→ Water depths from 2 to 4500 m.

→ Compatible with third party sources and recording systems as long as the Geo-Sense Filter/Gain Interface is used.

MARINE SURVEY SYSTEMS

Geo-Sense Mini-Streamers

ULTRA HIGH-RESOLUTION STREAMERS

An at least 4 m long outrigger remains one of the most important requirements to deploy the streamer out of the turbulence of the prop wash (left: small vessel; right: large vessel operations).

pre amplifier.

Technical Specifications

TOW CABLE

Length	Standard 50 m to 100 m
Diameter:	11 mm
Type:	3 × 2 × 24 AWG screened
twisted pair	
Insulation:	Polyurethane
Strain member:	Double reverse spiral Kevlar

ACTIVE SECTION & JACKET

Number of elements:	8 , 16, 24 up to 48
Spacing of elements:	0.3 m standard
Length of active section:	2.4 m / 7.2 m (for 8 / 24 elements)
Length of jacket:	5.4 m / 11.2 m (approx.)
Jacket size ID & OD:	20.5 mm & 26.5 mm
Jacket material:	Unreinforced polyurethane
Buoyancy:	Slightly positive
Array fluid:	Shell Sol T, Parafin oil or gel

PHYSICAL SPECIFICATIONS

Materials:	Fluoroelastomer, high strength epoxy, Hytrel® insulated leads
Weight in air:	14 grams
Size:	4.56 cm long x 1.32 cm diameter
Displacement:	6.24 cc
Temperature:	Operating: -10°C to 50°C
Storage:	-40°C to 60°C

PRE AMPLIFIER

Size:	60 × 16 mm
Gain:	26 dB
Ground reference:	Single-ended
Power:	9 -12 V DC (polarity protected)
High-pass:	-3 dB: 3 Hz
Low-pass:	-3 dB:13 kHz
Output impedance:	60 Ω

GEO MARINE SURVEY SYSTEMS

Sheffieldstraat 8, 3047 AP
Rotterdam, The Netherlands

GET IN TOUCH

Mail: info@geosys.nl
Tel: +31 10 4155755

MARINE SURVEY SYSTEMS

Geo-Sense Mini-Streamers

ULTRA HIGH-RESOLUTION STREAMERS

Technical Specifications

A2-2000 HYDROPHONE ELECTRICAL SPECIFICATIONS

Leads:	Two 28 AWG stranded conductors (red and black), Hytrel® insulation, 12.7 cm long each
Connector:	None
Polarity:	A positive increase in acoustic pressure generates a positive voltage on the red conductor
Capacitance:	4.5 nF +/- 25% at 20°C and 1 kHz
Resistance:	500 MΩ minimum across leads or to sea water at 20°C and 100% relative humidity, 50 V DC
Dissipation:	0.02 typical

PERFORMANCE

Sensitivity @ 100 Hz

Free-field voltage:

-201 dB re 1 V/µPa +/- 1.5 dB

Sensitivity change

Versus frequency: +/- 0.25 dB from 1 Hz to 1 kHz

(+/-2.0 dB from 1 kHz to 10 kHz)

Versus depth : < 0.5 dB to 1000 m

Versus temperature: < 0.03 dB per 1°C change

Acceleration Sensitivity

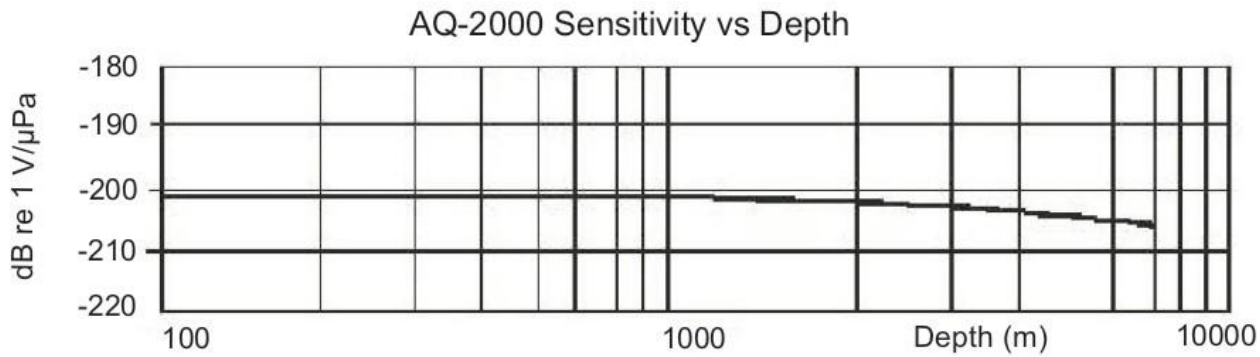
Output is <1.5 mV/g due to acceleration in any of the three major axes at 20 Hz

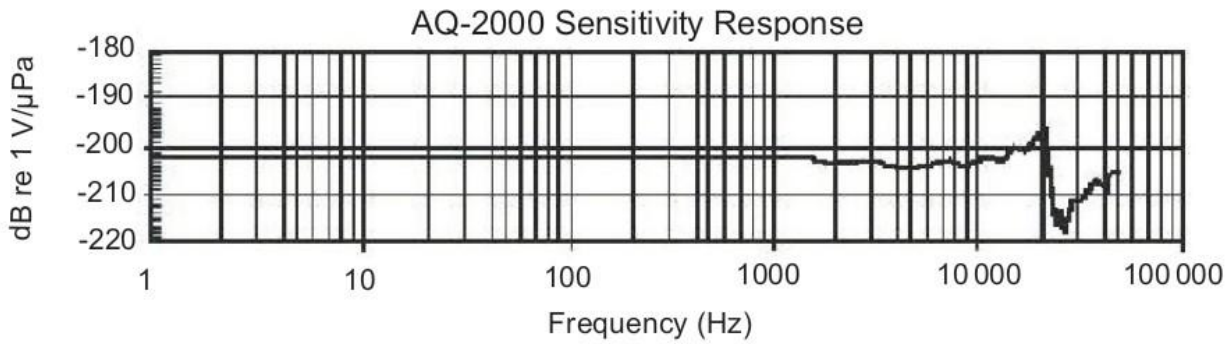
Mechanical

Resonance typically 20 kHz in water

Maximum operating depth of 2000 m

Destruction depth of more than 7000 m





geo-spark.com

MARINE SURVEY SYSTEMS

Geo-Source 200 Light Weight

MARINE MULTI-TIP SPARKER SYSTEM

Maintenance free negative discharge sparker specially designed for small vessel operations.

Description

INNOVATIVE PRESERVING ELECTRODE MODE
The Geo-Source 200 light weight is designed for operation with the Geo-Spark 1000 Pulsed Power Supply using the “Preserving Electrode Mode”. This patented concept consists of using a NEGATIVE electric discharge pulse, instead of a positive electric discharge pulse.

Note that working with a negative pulse is NOT the same thing as reversing the polarity of an antique power supply, which is generating a positive pulse.

MAINTENANCE FREE ELECTRODES 5 YEAR GUARANTEE
The Preserving Electrode Mode reduces the tip wear to practically zero. You can shoot day after day, week after week, month after month with practically NO tip maintenance.

OPTIMUM ACOUSTIC REPEATABILITY
Zero tip wear is essential for the repeatability of the acoustic pulse, which depends largely on a constant, unaltered electrode surface.

Operational Features

→ Specially designed for small vessel surveys.

→ Can be handled by one person.

→ Water depths from 2 to 500 m.

→ Penetration to 200 - 300 ms below seabed depending on geology.

→ Vertical resolution of 10 - 30 cm.

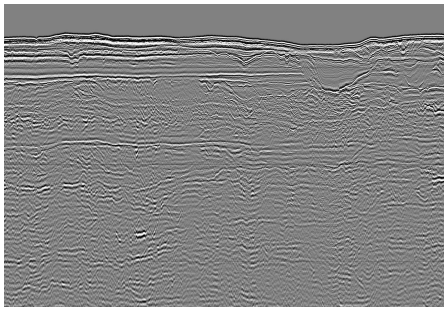
→ You don't need to trim tips during the survey - electrodes do NOT burn off.

→ Successfully employed in wind farm surveying, coastal engineering, sand search, site and route surveys and many others.

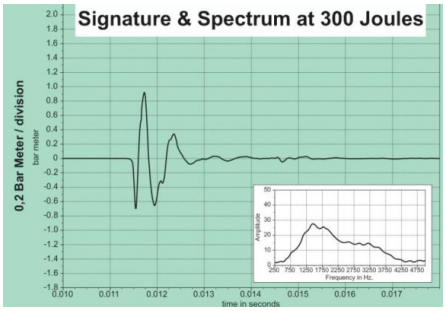
MARINE SURVEY SYSTEMS

Geo-Source 200 Light Weight

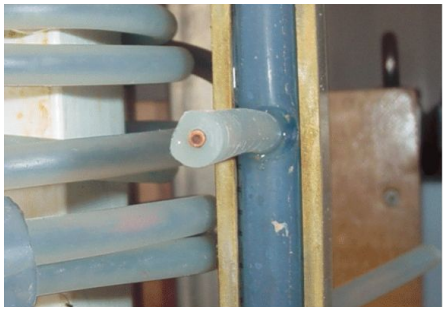
MARINE MULTI-TIP SPARKER SYSTEM



Geo Spark 200 and Multi-channel streamer.



broad signal spectrum at suitable power.



No wear of the tips even after 3 years of use.

Additional Features

CONTROL OF ALL SPARKER PARAMETERS
The effective source depth is 15-20 cm. A constant source depth at 1/4 of the wavelength is essential in order to optimize the constructive interference between the primary pulse and surface ghost. But this can be easily customized by the user with the use of extensions, for instance, in situations where penetration should be a priority.

SOURCE GEOMETRY AND CONFIGURATION OF THE TIPS
The electrode modules are evenly spaced in a planar array of 0.50 m x 1.00 m. This geometry not only enhances the downward projection of the acoustic energy, it also reduces the primary pulse length, since all tips are perfectly in phase. Each tip has an exposed surface of 1.4 mm, suitable for maximum 10 Joules per tip and with this configuration gives an excellent pulse over the 100 - 1000 Joule power range.

FLEXIBLE AND FLOATING HV TOW CABLE
A flexible, floating power/tow cable with the standard length of 25 m is available by default. This dedicated coaxial HV cable contains 4 leads of 6 mm^2 plus outer braiding of 24 mm^2. It is designed to have a low self-inductance in order to preserve the high dI/dt pulse output of the power supply. The wet side of the cable is terminated with two special HV connectors to the electrode modules and a ground connector to the frame. Connecting or disconnecting the cable to the sparker takes less than ten minutes. The cable weights only 35 kg and is easy to handle by one person. For large vessels we recommend the use of the standard 50 m floating HV Power cable on reel.

Specification

Dimensions (cm) & Weight	110 (L) x 100 (W) x 60 (H) for 45 kg
Number of Tips	200
Operation Depth (m)	0 - 500
Dominant Frequencies	1250 - 1750 Hz (at 400 J)
Better if used with	Geo-Spark 1000, Geo-Spark 2000, 8E single-channel Streamer, 24 multi-channel streamer
Recommended interface system	Mini-Trace II or Multi-Trace Server
Power Requirements	5kVA generator (for the Power Supply)

We are always pushing for improvements, so equipment specifications can change without notice.
Please keep in contact with support to stay in tune with the developments.

MARINE SURVEY SYSTEMS

Mini-Spark 1000
Portable HV Power Supply

PULSED POWER SUPPLIES

The Mini-Spark 1000 has been created to provide the portable high voltage PPS solution easy to mobilize at low cost.

Description

USER FRIENDLY AND SAFE
It integrates all unique features of the 2000 XF technology in a compact and lightweight design.

System status messages and operational parameters are displayed on comprehensive LCD.

All connections, command buttons, switches and status leds are intuitive and straightforward.

MAINTENANCE FREE ELECTRODES 5 YEAR GUARANTEE
The Preserving Electrode Mode reduces the tip wear to practically zero. You can shoot day after day, week after week, month after month with practically NO tip maintenance.

OPTIMUM ACOUSTIC REPEATABILITY
Zero tip wear is essential for the repeatability of the acoustic pulse, which depends largely on a constant, unaltered electrode surface.

Operational Features

→ Completely portable - can be easily handled by one person.

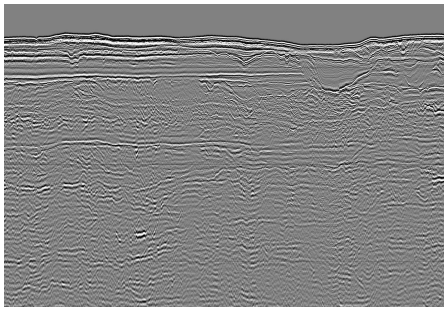
→ Negative discharge technology.

→ Very user friendly and safe

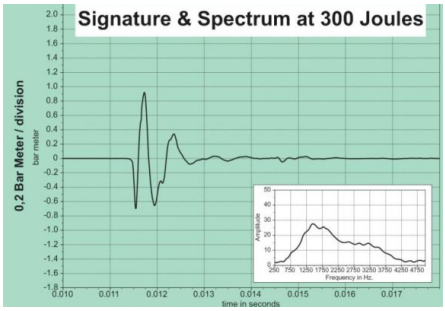
MARINE SURVEY SYSTEMS

Mini-Spark 1000
Portable HV Power Supply

PULSED POWER SUPPLIES



Geo Spark 200 and Multi-channel streamer.



broad signal spectrum at suitable power.

Portable carrier.

Additional Features

NEGATIVE HIGH VOLTAGE DISCHARGE
The Mini 1000 is using the Negative Discharge Technology allowing to acquire Ultra-High Resolution Seismic data day after day without wearing off the electrodes.
There is no other unit commercially available that allows you to generate a negative HV pulse with such a high dI/dt ratio.
The Hv discharge pulse has NO electrical oscillations, which affects the acoustic signature.
The state-of-the-art 10 kA thrystor allows high repetition rates and a perfect zero delay synchronization with the data acquisition system.

HIGH QUALITY SINGLE CHANNEL SPREAD AT LOW COST
The Mini-Spark (36 kg) in combination with the Geo-Source 200 LW marine sparker (35 kg), a 40 m flex & floating HV umbilical (40 kg), a Mini-Trace II UHRS acquisition system (10 kg), plus a short Geo-Sense Mini Streamer (20 kg) is a full seismic spread that can be handled by one person!

THE MINI-SPARK 1000 IS YOUR FIRST STEP TO DUAL SOURCE TECHNOLOGY
The innovative design of the Mini-Spark 1000 makes it possible to run one, two or three PPS' in parallel.
This unique feature opens effectively the way to the advanced dual or triple source technology, which allows to acquire the ultimate broad spectrum UHRS data.
Running two or more sparkers in parallel makes it possible to fire the sources in flip-flop or tuned mode.

SOME KEY FEATURES
- Undestructable Thrystor 10 kA-8000 V;
- High repetition rates - for instance: 4 shots of 500 J/s or 6 300 J shots/s;
- Very fast charging capability.

Specification

Dimensions (cm) & Weight	62 (L) x 50 (W) x 40 (H) & 36 kg
Energy output	From 100 to 1000 Joules (steps of 100 J)
Charging capability	2000 J per second
Better if used with	Geo-Source 200, Geo-Source 200 FW, Geo-Boomer 300-500
Recommended interface system	Mini-Trace II or Multi-Trace Server
Power Requirements	220-240 VAC 50-60 Hz from 16 A mains or 5 kVA generator

We are always pushing for improvements, so equipment specifications can change without notice.
Please keep in contact with support to stay in tune with the developments.

MARINE SURVEY SYSTEMS

Mini-Trace II

DATA RECORDING SYSTEMS

Timeless and reliable dual-channel very high (24-bit) seismic data recorder.

Description

MINI-TRACE II DUAL ACQUISITION MODULE

The new Mini-Trace II acquisition module is a very high resolution, 24-bit sigma-delta, seismic recorder, which can be interfaced to any suitable laptop or desktop computer, using a plug-and-play USB connection.

Navigation data is acquired via the LAN of the control PC or via a serial port on the acquisition module (for old systems).

TIMELESS AND RELIABLE HARDWARE

The Mini-Trace II is timeless and will serve you a long time. It features extremely reliable hardware with fully integrated electronics, which will outlast by many years the typical life time of the control computer.

DUAL MODE PROGRAMMABLE TRIGGERS

The module contains two independent channels with two independently programmable triggers allowing to synchronize two sources without interference (Asynchronous mode) In asynchronous mode: sparker + pinger, or sparker +water gun, but also sparker + side scan can be triggered in such a way that you will see no interference of the Sparker signal on the SSS data.

Data Recording

Internal SSD disks or external hard drives (USB 3.0 recommended) and remote network devices.
Automatic continuous recording switch-over.

All raw data files are recorded in Standard SEG Y format, with samples encoded in integers and can also exported in XTF format (16 bit). In addition, extensive logging in text files of all acquisition events, manual fixes, raw and processed navigation data.

MARINE SURVEY SYSTEMS

Mini-Trace II

DATA RECORDING SYSTEMS

Analogue Inputs

INPUTS AND OUTPUTS
The unit has two independent channels, each with an differential input ranging between +5 V and -5 V. The 24-bit sigma-delta A/D converter provides a 112 dB of dynamic range. This range eliminates the need to calibrate the AD converter for the incoming signal strength, thereby simplifying setup procedures, while retaining high data quality.

Trigger

TRIGGER INPUTS
Each channel has its own trigger input which is can be used for the slave mode. For instance with an external trigger from navigation for shooting at fixed distance. Standard TTL input via BNC at the rear. Accepts trigger pulse from 4 V up to 12 V, 10 mA, with a pulse length of 1 ms.

TRIGGER OUTPUTS
Each channel has its own trigger output which is can be used for the master mode, normally used to trigger the source in time. Standard TTL output via BNC at the rear.

PROGRAMMABLE TRIGGERS
The two triggers are fully programmable, including all options to set delays, time-breaks, differential triggering and custom triggering patterns.

Navigation

Navigation input is available via PC serial ports, LAN Network or Mini-Trace II dedicated serial port. The acquisition software supports NMEA data format or any other proprietary format navigation, fix and annotation strings.

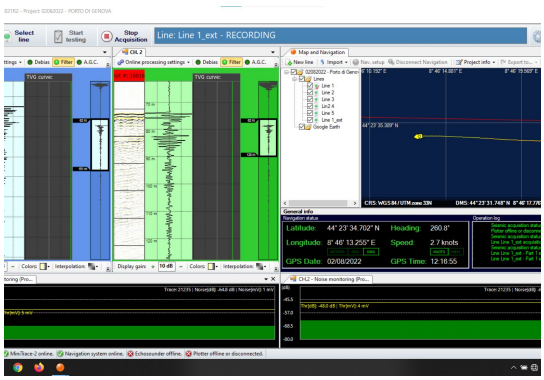
All data are logged and accessible in separate log files.

Display modes

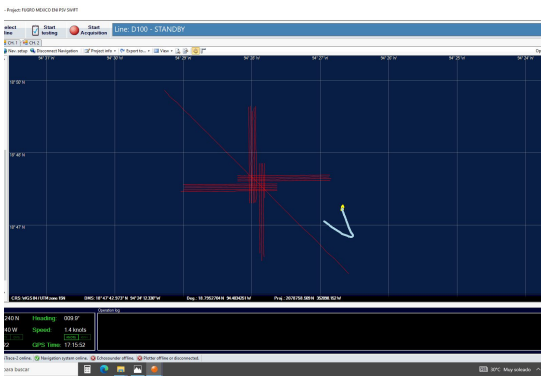
MULTIPLE SCREENS
Simultaneous display of the navigation map, multiple data channels and data types in multiple windows, on single or dual monitors.

CUSTOMIZABLE WINDOW LAYOUTS
ser-defined windows, Profile, Raw Trace, Processed Trace, Spectrum Analysis, Real-time Navigation track plot window, left/right, up/down, scroll directions.

NAVIGATION TRACK-PLOTS
Real-time navigation annotation on screen is standard, dedicated window for real time track plot, navigation editing, smoothing, speed correction etc.



Option for dual-channel seismic acquisition.

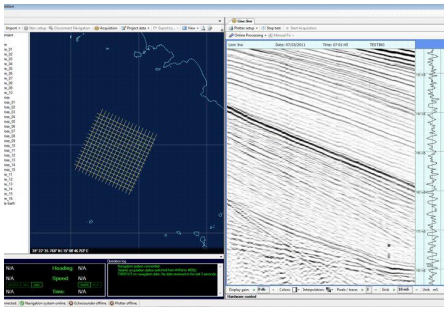


Powerful GIS-based navigation.

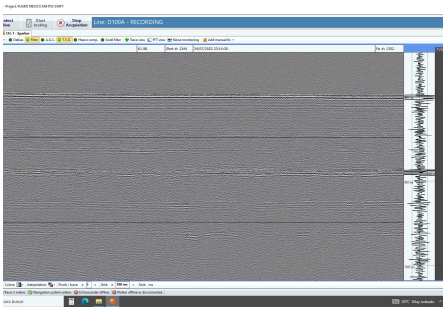
MARINE SURVEY SYSTEMS

Mini-Trace II

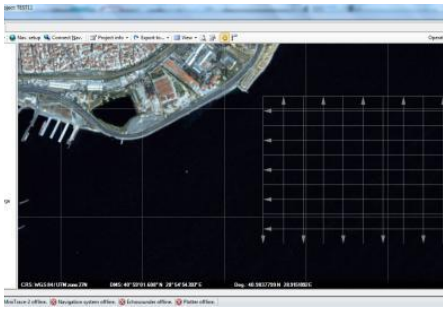
DATA RECORDING SYSTEMS



Real-time navigation and data display.



Efficient acquisition interface for quality control.



Dynamic platform for planning and carrying out your survey.

Software Interface

THE LATEST VERSION OF GEOSUITE ACQUISITION

The GeoSuite Acquisition software is written using the latest development technologies available for the 64 bit windows platform.

By taking advantage of the windows network infrastructure it is possible to run post processing tasks on the GeoSuite Allworks PC while acquiring data on the GeoSuite Acquisition PC.

AUTOMATIC SOFTWARE UPDATES

Software updates are now fully automatic via the Internet. Just connect your system and the GeoSuite software will check if you need any updates. Online support and news is available via www.geo-spark.com.

EFFICIENT ONLINE QUALITY CONTROL

The new status monitor makes recording of very high quality seismic data very easy. It tells you all you need to know about the dynamic range in use. The software also analyses your settings and warns you for any problems, which might occur in your recording.

REAL-TIME NAVIGATION MAP

The navigation map is displayed in real-time showing your current position and route. You can combine it with any geo-referenced background e.g. from Google Earth. You can also use public domain data from hydrographic data bases. To generate a track plot of the seismic lines is just one click of the mouse.

SEAMLESS INTEGRATION WITH GEOSUITE ALLWORKS

GeoSuite Acquisition software outputs the raw data as a standard SEG-Y file, which is seamlessly imported into Geo-Suite AllWorks. Alternative you export the data in XTF format for import in any other third party environment.

GEO MARINE SURVEY SYSTEMS

Sheffieldstraat 8, 3047 AP
Rotterdam, The Netherlands

GET IN TOUCH

Mail: info@geosys.nl
Tel: +31 10 4155755

MARINE SURVEY SYSTEMS

Mini-Trace II

DATA RECORDING SYSTEMS

Physical Specifications

Models	**Portable** Slim-line module with High-quality 17" laptop **Workstation version** Slim-line module with 19" stainless steel mounting brackets 19" rack mountable industrial workstation plus wall mounted monitor(s)
Dimensions (cm)	**Acquisition Module** 45 (L) x 40 (W) x 28.5 (H)
Shipping Cases	- Portable version: in laptop hand carry bag or in indestructible watertight PELI case - Workstation 19" rack-mountable system: delivered in flight case
Mains Power	- Portable version: 100-240 Volts 50-60 Hz AC, mains power failure protected - Workstation 19" rack-mountable system: 100-240 Volts 50-60 Hz AC, UPS is always recommended
Processor	- Portable version Intel Dual Core 2.0 GHz or better - Workstation 19" rack-mountable system Intel Dual Core 2.0 GHz or better
Hard disks	- Portable version: minimum 2 Gigabyte - Workstation 19" rack-mountable system: minimum 2 Gigabyte
Multiple screens	Dual screens are optional for the Laptop and Multiple Screens depend on the choice of the workstation For the 19" rack-mountable systems we recommended wall mounted screens, which can be suitably placed in the survey room
3-year guarantee	Each Mini-Trace II module comes with a 3-year guarantee for any hardware breakdown, which is not due to an operator error, over voltage or obvious negligence.

GEO MARINE SURVEY SYSTEMS

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Mail: info@geosys.nl
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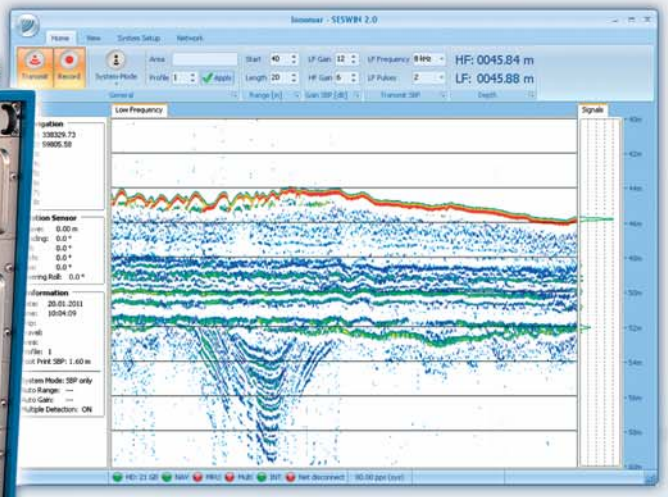
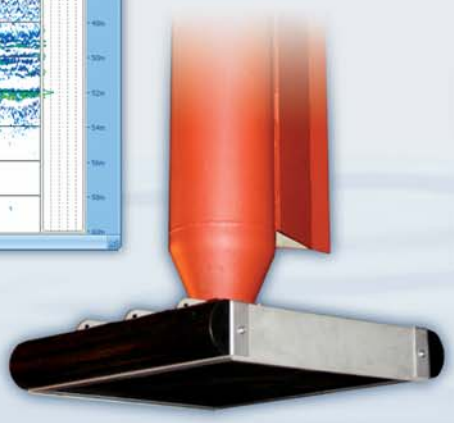
Top-side unit



Screenshot of the operating software

Transducer



SES-2000 medium-100

Parametric Sub-bottom Profiler

Performance
- water depth range: 2 – 2,000 m
- penetration: up to 70 m, depending on sediments
- layer resolution: up to 5 cm
- motion compensation: heave, roll, pitch (option)
- beam width @ 3 dB: ±1 ° / footprint < 3.5 % of water depth for all frequencies

Transmitter
- primary frequencies: approx. 100 kHz (band 85 – 115 kHz)
- secondary low frequencies: 4, 5, 6, 8, 10, 12, 15 kHz (band 2 – 22 kHz)
- primary source level: > 247 dB//µPa re 1 m
- pulse width: 0.07 – 2 ms
- pulse rate: up to 40/s
- multi-ping mode
- pulse type: CW, Ricker, LFM (chirp)

Acquisition
- primary frequency (echo sounder, bottom track)
- secondary low frequency (sub-bottom data, multi-frequency mode)
- sample rate 96 kHz @ 24 bit

System Components
- transceiver unit 19 inch / 16 U (WHD: 0.52 m x 0.74 m x 0.50 m; 90 kg)
- transducer incl. cable (WHD: 0.60 m x 0.15 m x 0.50 m; 90 kg)
- system control: internal PC
- KVM remote control

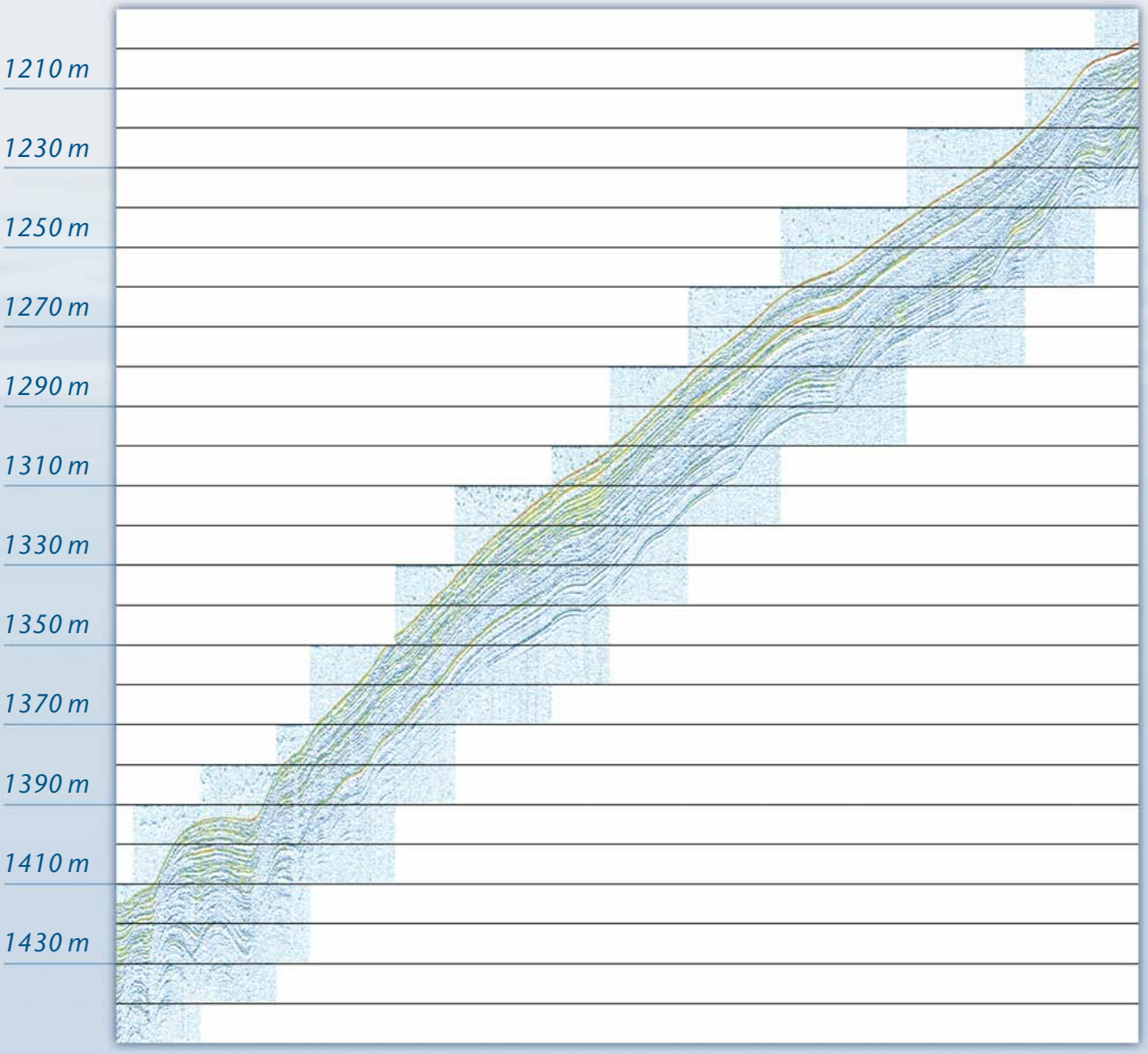
Software
- SESWIN data acquisition software
- SES Convert SEG-Y/XTF data export
- SES NetView remote display
- ISE post-processing software

Power Supply Requirements
- 100 – 240 V AC / 50 – 60 Hz
- power consumption: < 700 W

Innomar

www.innomar.com

Survey example of SES-2000 medium-100



Pacific (Chile) echo plot example *– Frequency 8 kHz, pulse length 800 µs, profile length 10800 m*

Innomar Technologie GmbH

Schutower Ringstraße 4
D-18069 Rostock
Phone (Fax) +49 381 44079-0 (-299)
E-Mail info@innomar.com

Innomar

www.innomar.com

END OF DOCUMENT

TYRRHENIAN WIND ENERGY

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Engineering & Consulting Studio

PARCO EOLICO OFFSHORE AL LARGO DELLE COSTE DI CIVITAVECCHIA PROGETTO DEFINITIVO		
Rapporto sulle indagini a mare		
Codice documento: **C0123YR00GEOMAR00a**	Data emissione: **Luglio 2023**	

Taranto, Luglio 2023 *Dott. Ing. Luigi Severini*