FIUMICINO WATERFRONT

*SOGGETTO ESECUTORE E FINANZIATORE*

GIUBILEO 2025 PELLEGRINI DI SPERANZA

*INTERVENTO N. 146*

CITTÀ DI FIUMICINO

*SOGGETTO PROPONENTE ED ATTUATORE*


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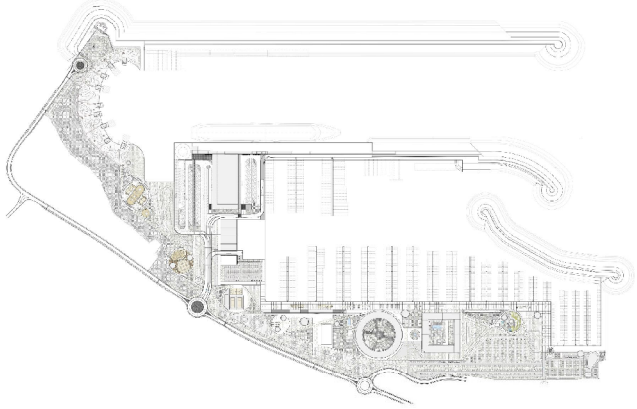
# PORTO TURISTICO-CROCIERISTICO DI FIUMICINO ISOLA SACRA

**CUP:F11I22000320007**

# PROGETTO DI FATTIBILITÀ TECNICO ECONOMICA



00_INQUADRAMENTO GENERALE
AMBIENTE E PAESAGGIO

# RAPPORTO DI CAMPO - INDAGINI ROV : ANNO 2022

| COMMESSA | SERVIZIO | LOTTO | OPERA | DISCIPLINA | TIPO | PROG. | REV. | SCALA |
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| P0031150 | D | 0 | MP00 | AM | REL | 04 | 00 | - |

| REV. | DESCRIZIONE | REDATTO | VERIFICATO | APPROVATO | DATA |
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# PREMESSA

Il presente documento è stato redatto, in lingua inglese, nell'ambito dell'attività di definizione del Master Plan del progetto "Porto di Fiumicino Isola Sacra", consegnato ad Ottobre 2022 e commissionato dalla Royal Caribbean Group Ltd, quale titolare, all'epoca, della relativa concessione.

Il rapporto, in considerazione della sua validità, è ora integrato nel corpo documentale appartenente alla attuale fase di Progetto di Fattibilità Tecnico Economica del Porto turistico-crocieristico di Fiumicino Isola Sacra, commissionato dalla Fiumicino Waterfront Srl, subentrata nella titolarità di detta concessione.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **A** | Area (of potential archaeological interest) |
| **ARC 000** | Punctual observation of a Target and / or Area (of potential archaeological interest) |
| **ARCH** | Transect/Area of potential archeological interest |
| **COC** | Chain of Custody |
| **CL** | Contact List |
| **DPR** | Daily Progress Report |
| **DTM** | Digital Terrain Model |
| **ENV** | Transect/Area of potential environmental interest |
| **MA** | Macro Area of potential archeological interest |
| **MBES** | Multibeam Echosounder |
| **RCCL** | Royal Caribbean Cruises Ltd |
| **ROV** | Remotely operated vehicle |
| **SSS** | Side Scan Sonar |
| **SSS 000** | Punctual observation of a Target and / or Area (of potential archaeological interest) |
| **TA** | Target |
| **TAA** | New Target of potential archaeological interest |
| **TB** | Target: Boulders o Large Rocks |
| **TD** | Target: Debris |
| **TE** | Target: Depressions o Ripples |
| **TR** | Transect |
| **ORP** | Redox potential |
| **WD** | Water depth |

## EXECUTIVE SUMMARY

This document reports the activities and the first results obtained during the ROV visual inspection for the Fiumicino Isola Sacra Cruise Project, Italy., for which Royal Caribbean Cruises Ltd entrusted the performance of activities to RINA Consulting S.p.A.

The construction phase will include seabed dredging, in order to increase the depth up to the bathymetric depth of -12.5 m and to create an approach channel and relevant evolution basin with the aim of allowing the cruise ships approach manoeuvre.

The environmental surveys, including the archeological ones, performed in the Isola Sacra port of Fiumicino (Rome, Italy), consist mainly in a baseline survey and, in conjunction with geophysical and geotechnical investigations, it will integrate engineering data.

The objectives of the ROV survey were both archaeological and environmental. A visual inspection of targets and areas of archaeological and environmental interest was performed.

The environmental and archeological visual inspection was performed as follows:

- ✓ Archeological targets were identified thanks to the previous geophysical analysis with Multibeam Echosounder (MBES) and Side Scan Sonar (SSS), a SSS Contact List (CL) was created;
- ✓ Environmental areas of interest were identified based on previous SSS and MBES geophysical surveys results;
- ✓ Areas and transects of both environmental and archeological interest were selected.

The mobilization of equipment and personnel began on the 06$^{th}$ of June. Field operations started on 07$^{th}$ of June 2022 and were performed for seven days onboard of the N/O Vega Uno on a 12h basis. The archeologist joined the team on the 8$^{th}$ of June. On the 9$^{th}$ and 10$^{th}$ of June weather conditions did not allow to continue the investigations. The ROV survey was resumed on the 11$^{th}$ and completed on the 13$^{th}$ of June. Personnel and equipment have been demobilized on the 13$^{th}$/14$^{th}$ of June 2022.

The inspections performed on the first day were repeated after adding the USBL TrackLink underwater positioning system to the ROV.

The locations of the ROV survey were chosen, based on SSS mosaic and contact list, to be used for both environmental and archaeological purposes and were mostly located in the Project Area and in the future Approach Channel and Rotation Basin.

4 archeological areas (ARCH), 17 transects (ENV_TR or ENV_ARCHEO TR) of both environmental and archeological interest (some subdivided in segments: A, B, C …) and 5 isolated SSS targets (SSS) of archeological interest were investigated: ENV_TR15, ENV_TR13, ENV_TR12, ENV_TR05, ARCH46, ARCH16, ARCH42, ARCH29, ENV_TR01, ENV_ARCHEO TR02, ENV_ARCHEO TR03, ENV_ARCHEO TR03B, ENV_ARCHEO TR04, ENV_ARCHEO TR06, SSS_182, ENV_ARCHEO TR07, ENV_ARCHEO TR09, ENV_ARCHEO TR17 PARTIAL, ENV_ARCHEO TR17, ENV_ARCHEO TR16A, ENV_ARCHEO TR16B, ENV_ARCHEO TR16C, ENV_ARCHEO TR16D, ENV_ARCHEO TR16E, ENV_ARCHEO TR16F, ENV_TR10, SSS_232, SSS_494, ENV_TR13REP, ENV_ARCHEO TR11, ENV_ARCHEO TR11A, ENV_ARCHEO TR11B, ENV_ARCHEO TR08, ENV_ARCHEO TR08A, ENV_ARCHEO TR14, ENV_ARCHEO TR14A, ENV_TR05REP, ENV_TR12REP, ENV_TR12REPA, ENV_TR15REP, SSS_811, SSS_808.

From an archaeological point of view the presence of ancient artifacts, or in any case of strictly archaeological interest, was not detected. Debris related to the nautical and fishing activities present in the area, as well as rock material from artificial reefs, concrete poles, and plastic debris were observed.

From an environmental point of view the only observed species to be reported are some specimens of Pennatulacea (*Virgularia mirabilis*) and two specimens of *Hippocampus* sp (probably *Hippocampus guttulatus*). The seabed is characterized by sand with different grain size and silt percentage depending on the distance from the coast.

Several eggs of gastropods were observed, and the most abundant organisms observed were of the orders Decapoda and Pennatulacea.

# 1 INTRODUCTION

## 1.1 GENERAL

This document reports the activities and the preliminary results obtained during the ROV visual inspections performed to provide an environmental characterization of the site before the development of the future planned facilities for the Isola Sacra Cruise Project in Italy of Royal Caribbean Cruises Ltd (RCCL).

## 1.2 PURPOSE OF THE DOCUMENT

The purposes of this document are to report the activities performed during the visual inspections and the preliminary results obtained during this survey.

# 2 STUDY AREA

The study area is a portion of the marine-coastal area in front of Isola Sacra, Municipality of Fiumicino, Rome, limited along the coast to the north by the port-canal of Fiumicino and to the south by the Tiber River.

The study area was subject, during the first decade of the 2000s, to the project for the construction of a new tourist port (Porto della Concordia). The project included several options for the construction of new piers, a navigation channel, and a rotation basin. The project was not completed, the only works completed (in the sea part) are the protective cliffs of the beach and a breakwater that extends for about 800 m in the North / North-West direction (NNW) starting from the South-Western corner of the harbour, where the lighthouse is located.

The completion of the project implies an excavation of the future port area and of the area facing it, in order to increase its depth up to the bathymetric depth of -12.5 m and to create an approach channel and relative evolution basin capable of allowing the manoeuvre of cruise ships. The excavation of the approach channel will be extended up to about 3000 m from the future port area.

The following figure represents the study area. The perimeter of the project area (intended for the construction of works at sea) is indicated in red, while the perimeter of the area intended for dredging is represented in blue.

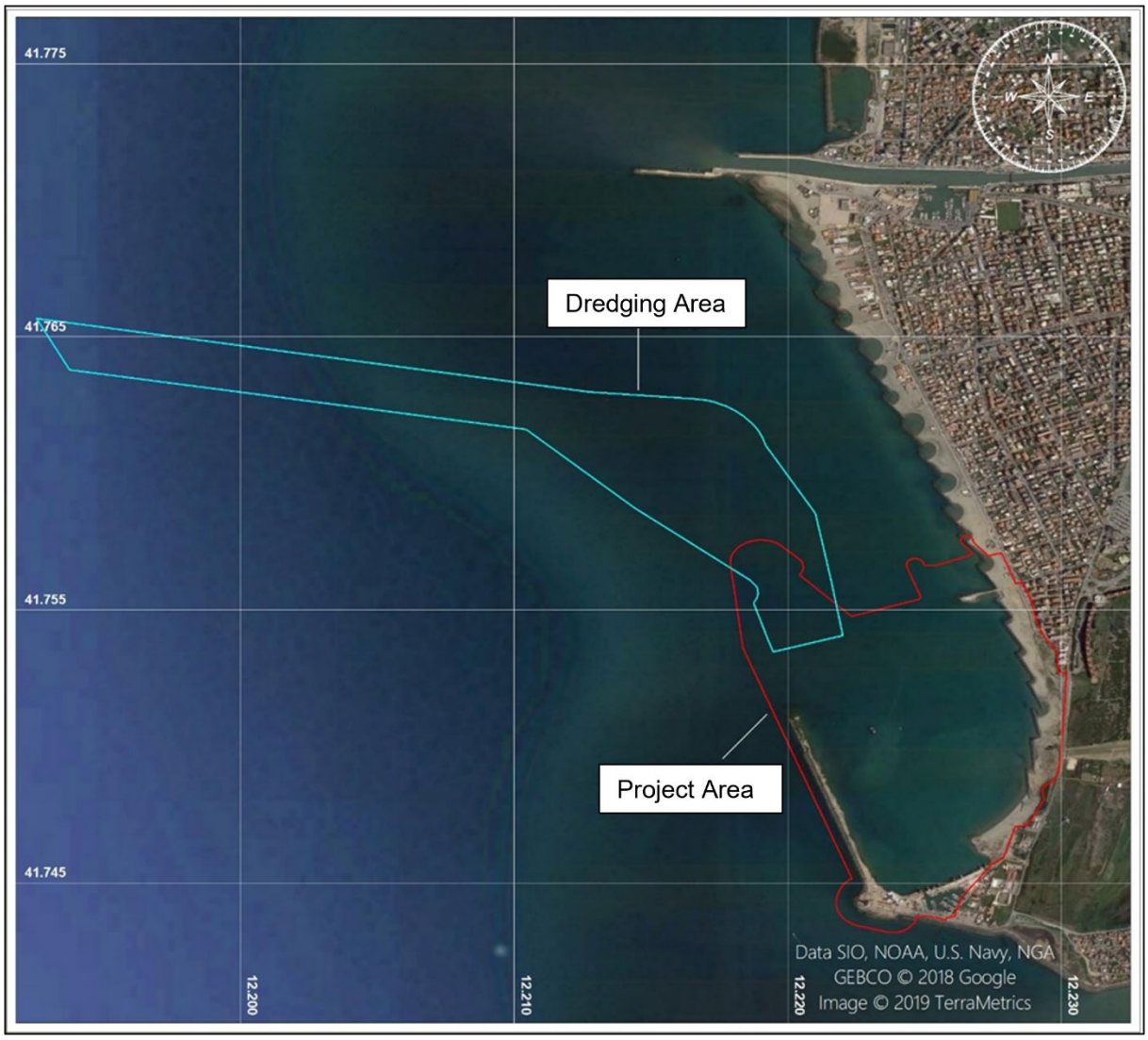


**Figure 2.1: Study area. Perimeter of the Project and Dredging Areas.**

# 3 ENVIRONMENTAL CHARACTERIZATION PLAN

The full environmental characterization plan is briefly summarized in the following points:

- ✓ ROV survey: visual inspections of the area affected by the project and the dredging;
- ✓ Physical, chemical, and biological, characterization of the water column;
- ✓ Survey on the current meter regime of the area;
- ✓ Physical, chemical, microbiological, and ecotoxicological characterization of marine sediments;
- ✓ Quali-quantitative characterization of macrozoobenthic community.

## 3.1 ROV SURVEY -ARCHEOLOGICAL AND ENVIRONMENTAL

A visual inspection of the seabed with an ROV was performed to:

- ✓ Identify and characterize the phyto-zoobenthic communities, benthic biocenoses and seagrasses;
- ✓ Identify and characterize potential archaeological artifacts.

### 3.1.1 METHODS -ARCHEOLOGICAL AND ENVIRONMENTAL

From an archeological point of view, the project area, given the advancement of the mouth of the Tiber River and the adjacent lands over the last 2500 years, is today about 4.4 km from the coastline of the 1$^{st}$ century AD and about 2.7 km from that of the 4$^{th}$ century AD, and about 1.6 km from that of the 16$^{th}$-18$^{th}$ century. Therefore, the area must be interpreted as an offshore area in times of archaeological interest. In such context it is therefore plausible to expect a possible presence of wrecks, or isolated artifacts, not those areas of dispersion of artifacts that often characterize the ancient port areas.

The preliminary analysis of the SSS mosaic and of the MBES did not return any trace clearly attributable to wrecks, but revealed the presence of numerous presumed targets, isolated or concentrated in areas. The initial SSS contact list was of 827 targets. A subs election of areas and targets was done based on the SSS contact list estimate of size and type (Debris, Boulders and Large rocks, Depression and Ripples) and comparing the SSS mosaic with the DTM.

From an environmental point of view the seabed features to be investigated were chosen based on SSS mosaic areas with different acoustic responses to be verified.

The archologist identified 49 Areas of Potential Archaeological Interest (A), with already defined or new targets. Based on the in-depth investigations carried out, some of these areas were then cancelled due to verified improbability or inconsistency or non-interest of the traces found, which led to the actual selection of 22 Areas.

The areas and targets to be investigated were chosen based on these criteria:

- ✓ Type: Debris (TD) or Boulders and Large rocks (TB)
- ✓ Size: Height 0-19 cm (TD1 / TB1), 20-39 cm (TD2 / TB2), 40-120 cm (TD3 / TB3)
- ✓ Number of targets concentered in an area
- ✓ Correspondence of the traces in SSS and MBES mosaic
- ✓ Targets inside work area
- ✓ Conjugation of the environmental and archaeological interest

These areas were then transformed into New Archaeological Targets (TAAs), including 33 and 40/41, corresponding to concentration areas. Then, based on their topographical arrangement, they were grouped into 7 Macro Areas of Potential Archaeological Interest (MAs), plus two others outside the work area.

The 7 MA inside the work area were all investigated. 4 archeological areas (ARCH), 17 transects (ENV_TR or ENV_ARCHEO TR) of both environmental and archeological interest (some subdivided in segments: A, B, C …) and 5 SSS targets (SSS) of archeological interest were investigated: ENV_TR15, ENV_TR13, ENV_TR12, ENV_TR05, ARCH46, ARCH16, ARCH42, ARCH29, ENV_TR01, ENV_ARCHEO TR02, ENV_ARCHEO TR03, ENV_ARCHEO TR03B, ENV_ARCHEO TR04, ENV_ARCHEO TR06, SSS_182, ENV_ARCHEO TR07, ENV_ARCHEO TR09, ENV_ARCHEO TR17 PARTIAL, ENV_ARCHEO TR17, ENV_ARCHEO TR16A, ENV_ARCHEO TR16B, ENV_ARCHEO TR16C, ENV_ARCHEO TR16D, ENV_ARCHEO TR16E, ENV_ARCHEO TR16F, ENV_TR10, SSS_232, SSS_494, ENV_TR13REP, ENV_ARCHEO TR11, ENV_ARCHEO TR11A,

ENV_ARCHEO TR11B, ENV_ARCHEO TR08, ENV_ARCHEO TR08A, ENV_ARCHEO TR14, ENV_ARCHEO TR14A, ENV_TR05REP, ENV_TR12REP, ENV_TR12REPA, ENV_TR15REP, SSS_811, SSS_808.

The following figure represents the Targets, Areas, Macro Areas and Transects and the ROV investigations track plot.

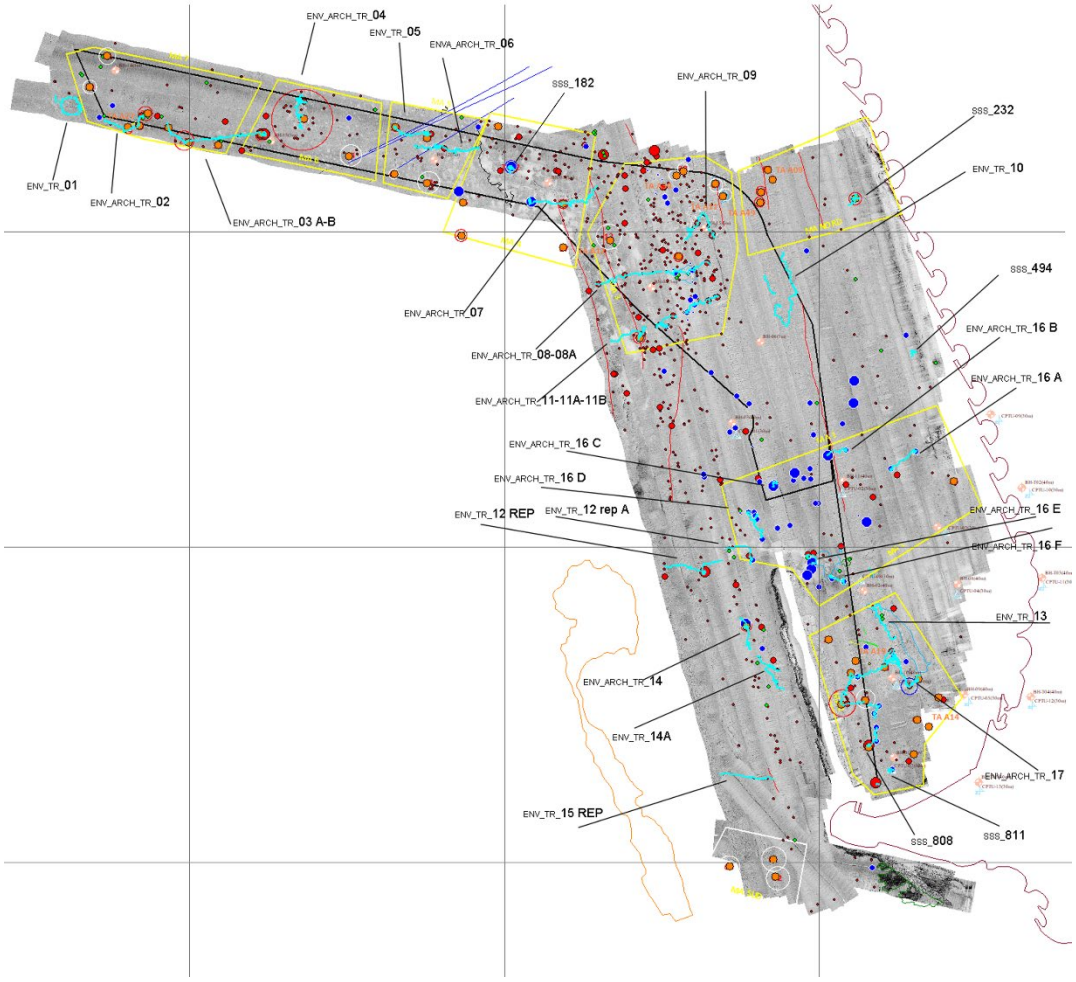


**Figure 3.1: Targets, Areas, Macro Areas and Transects on SSS mosaic**

The list of the transects/areas investigated is reported in the following table.

**Table 3.1: ROV survey**

| ID | DATE | STARTING TIME (UTC +2) | ENDING TIME (UTC +2) |
|---|---|---|---|
| ENV_TR15 | 07/06/2022 | 10:32 | 11:44 |
| ENV_TR13 | 07/06/2022 | 13:10 | 14:14 |
| ENV_TR12 | 07/06/2022 | 15:07 | 16:47 |
| ENV_TR05 | 07/06/2022 | 17:16 | 17:57 |
| ARCH46 | 08/06/2022 | 08:37 | 08:47 |

| ID | DATE | STARTING TIME (UTC +2) | ENDING TIME (UTC +2) |
|---|---|---|---|
| ARCH16 | 08/06/2022 | 08:58 | 09:05 |
| ARCH42 | 08/06/2022 | 09:37 | 09:47 |
| ARCH29 | 08/06/2022 | 10:08 | 10:12 |
| ENV_TR01 | 11/06/2022 | 08:28 | 09:03 |
| ENV_ARCHEO TR02 | 11/06/2022 | 09:23 | 09:47 |
| ENV_ARCHEO TR03 - ENV_ARCHEO TR03B | 11/06/2022 | 10:09 | 11:42 |
| ENV_ARCHEO TR04 | 11/06/2022 | 11:55 | 12:30 |
| ENV_ARCHEO TR06 | 11/06/2022 | 13:29 | 14:11 |
| SSS_182 | 11/06/2022 | 14:25 | 14:41 |
| ENV_ARCHEO TR07 | 11/06/2022 | 14:57 | 15:55 |
| ENV_ARCHEO TR09 | 11/06/2022 | 16:48 | 17:16 |
| ENV_ARCHEO TR17 PARTIAL | 11/06/2022 | 17:48 | 17:56 |
| ENV_ARCHEO TR17 | 12/06/2022 | 08:11 | 12:31 |
| ENV_ARCHEO TR16A - ENV_ARCHEO TR16B - ENV_ARCHEO TR16C - ENV_ARCHEO TR16D - ENV_ARCHEO TR16E - ENV_ARCHEO TR16F | 12/06/2022 | 13:28 | 16:10 |
| ENV_TR10 | 12/06/2022 | 16:48 | 17:15 |
| SSS_232 | 12/06/2022 | 17:37 | 17:46 |
| SSS_494 | 12/06/2022 | 17:59 | 18:04 |
| ENV_TR13REP | 13/06/2022 | 08:01 | 08:22 |
| ENV_ARCHEO TR11 - ENV_ARCHEO TR11A - ENV_ARCHEO TR11B | 13/06/2022 | 08:46 | 10:00 |
| ENV_ARCHEO TR08 - ENV_ARCHEO TR08A | 13/06/2022 | 10:18 | 11:17 |
| ENV_ARCHEO TR14 - ENV_ARCHEO TR14A | 13/06/2022 | 11:36 | 12:31 |
| ENV_TR05REP | 13/06/2022 | 13:30 | 13:59 |
| ENV_TR12REP- ENV_TR12REPA | 13/06/2022 | 14:32 | 15:45 |
| ENV_TR15REP | 13/06/2022 | 16:06 | 16:26 |
| SSS_811 | 13/06/2022 | 17:37 | 17:43 |
| SSS_808 | 13/06/2022 | 17:47 | 17:53 |

### 3.1.2 GEODETIC DATUM AND TIME REFERENCE

The coordinates indicated in this project are referred to Project Datum: Roma 40, Projection: Gauss-Boaga (Monte Mario / Italy zone 2). The time reference used during the survey is local time (UTC + 2).

# 4 VISUAL INSPECTION OF SEABEDS AND ARCHEOLOGICAL CHARACTERIZATION

## 4.1 CHRONOLOGY OF OPERATIONS

### 4.1.1 MOBILIZATION

Equipment and personnel were mobilized to Fiumicino between the 05th and the 07th of June 2022. The survey vessel and the team were ready to start operations on the 7th of June 2022.

### 4.1.2 SURVEY OPERATIONS

Field operations started on 7th June 2022 and ended on the 13th of June. On the 9th and 10th weather conditions did not allow to proceed with the survey so the team remained on stand-by meteo.

### 4.1.3 DEMOBILIZATION

Personnel and the equipment were demobilized on the 14th of June.

## 4.2 EQUIPMENT AND PERSONNEL

### 4.2.1 SURVEY VESSEL

The survey was performed by using the vessel Vega Uno equipped with surface positioning system. The operations were executed on 12/7 basis.

The technical data sheet is provided in APPENDIX A.


Figure 4.1: Vega Uno Vessel

### 4.2.2 POSITIONING SYSTEM

The surface positioning system was performed through Starfix Positioning and Navigation system (following table). The status of the DGPS was checked before every deployment.

Table 4.1: Vega Uno positioning equipment

| Positioning System | Antenna | Receiver | Software |
|---|---|---|---|
| Primary | 1 x Fugro ANTENNA AD491-3141 GLONASS/L1/L2/DGPS | 1 x Fugro STARPACK GNSS RECEIVER UNIT | Fugro Navigation Software Starfix NG |
| Secondary | 1 x Fugro ANTENNA AD491-3141 GLONASS/L1/L2/DGPS | 1 x Fugro STARPACK GNSS RECEIVER UNIT | |

The ROV underwater positioning system was the USBL TrackLink. USBL system was installed onboard on calibrated fixed pole on the starboard side of the vessel.

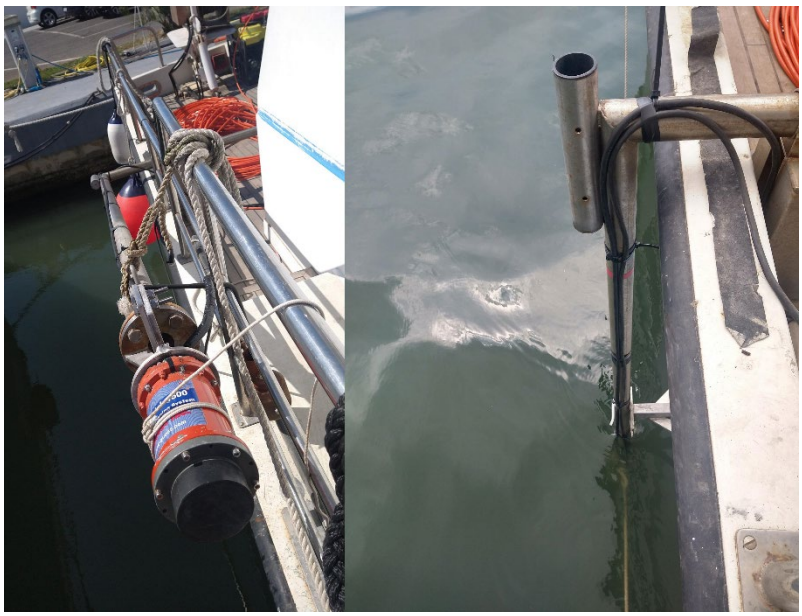

Figure 4.2: TrackLink transceiver.

Static positioning verification was initially carried out with the vessel alongside Netter dockyard by placing the beacon, at a known depth, respectively at the center of Vessel Port and Starboard, and at the center stern and bow. A further verification was carried out with the beacon mounted on the ROV in a 3.5m water depth (WD). Good position and stable signal were received from transponder up to 35m distance from the Vessel.

The technical data sheets are provided in APPENDIX A.

### 4.2.3 EQUIPMENT

Videos were performed by using the observer class ROV POLLUX III equipped with a triangle of 3 laser pointers (red) 15 cm away from each other, to allow an estimate of the size of the objects identified. The technical data sheets are provided in APPENDIX A.

Figure 4.3: ROV Pollux III with TrackLink beacon.

### 4.2.4 FIELD TEAM

The ROV survey activities were coordinated by a RINA Consulting S.p.A. Site Manager (L. Urbini) and a Fugro Party Chief (R. Fantini). The vessel navigation and positioning were managed D. Proia, while the ROV piloting was managed by D. Gitto. The video inspections were checked by the RINA Site Manager and by the archeologist present onboard (S. Lorenzatti).

Table 4.2: List of personnel involved in the ROV survey

| Role | Name | Company |
|---|---|---|
| Site Manager | Lidia Urbini | RINA |
| Party Chief | Raffaele Fantini | Fugro |
| Surveyor | Davide Proia | Fugro |
| ROV Engineer | Daniele Gitto | Fugro |
| Archeologist | Sandro Lorenzatti | RINA |

## 4.3 DAILY ACTIVITIES

The following paragraphs provide a summary indication of the activities carried out and of the observations made.

The data reported are to be considered as synthetical field notes and will be reworked as recorded video will be further analyzed in deep in order to better describe targets nature and species identification. Seabed features identified through visual inspections will be integrated with sediment chemical, physical and biological analysis results to fully describe habitat and biocenosis in the project area.

APPENDIX B include the whole set of Daily Progress Reports (DPRs) submitted by RINA to RCCL with details about the chronology of the operations.

The complete and detailed photographic documentation, accompanied by specific measurements and coordinates, will be included in the Final Report.

## 4.4 7TH JUNE 2022

Table 4.3: Investigated items 07/06/2022

| ID | STARTING TIME | ENDING TIME |
|---|---|---|
| ENV_TR15 | 10:32 | 11:44 |
| ENV_TR13 | 13:10 | 14:14 |
| ENV_TR12 | 15:07 | 16:47 |
| ENV_TR05 | 17:16 | 17:57 |

Transects performed on the 7th of June will not be described due to the scarce visibility. These transects inspection was repeated on the 13th of June.

### 4.4.1 8th June 2022

Table 4.4: Investigated items 08/06/2022

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| ARCH46 | 08:37 | 08:47 | 770, 776 | Poor ROV visibility (Figure 4.4), no targets identified, repeated on 13th June 2022 |
| ARCH16 | 08:58 | 09:05 | | Poor ROV visibility, no targets identified, repeated on 13th June 2022 |
| ARCH42 | 09:37 | 09:47 | | Poor ROV visibility |
| ARCH29 | 10:08 | 10:12 | | Poor ROV visibility |


Figure 4.4: Example of visibility

The worsening of weather conditions and the absence of visibility due to the very high turbidity prevent the recording of acceptable videos. The team remained on stand-by for the rest of the day. The persistence of such low visibility conditions led the survey team to decide to install USBL underwater positioning system to improve performances.

### 4.4.2 9th June 2022

Given the prohibitive sea conditions no inspection was performed, but USBL system was installed onboard over the side pole.

A review of the data for a better organization and effectiveness of the investigations was carried out.

### 4.4.3 10th June 2022

Given the prohibitive sea conditions, the team remained on stand-by. A review of the data for a better organization and effectiveness of the investigations was carried out.

### 4.4.4 11th June 2022

**Table 4.5: Investigated items 11/06/2022**

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| ENV_TR01 | 08:28 | 09:03 | NO TARGET | Sandy sediment with bioturbation (*Octopus vulgaris* specimen) (Figure 4.5)<br>Abandoned net with rests of bivalve molluscs specimens of algae and *Hippocampus* sp. (Figure 4.6) |
| ENV_ARCHEO TR02 | 09:23 | 09:47 | 79 (TD1)<br>106 (TD1)<br>090 (TB1)<br>080 (TD2)<br>050 (TD2)<br>056 (TD1)<br>048 (TE) | Sandy sediment with bioturbation (Figure 4.7)<br>Branch fragment with concretions, cables at TA 106 and TA 90<br>Tire (probably TA 056 shifted to N (Figure 4.8)<br>No other targets indicated identified |
| ENV_ARCHEO TR03 - ENV_ARCHEO TR03B | 10:09 | 11:42 | 073 (TE)<br>128 (TE)<br>104 (TD1)<br>110 (TD1)<br>097 (TD3)<br>098 (TD2)<br>099 (TD3) | Sandy sediment with bioturbation and with ripple marks due to currents.<br>10.22 Plastic fragment<br>10.26 Plastic fragment<br>10.34 Cable, *Hippocampus* sp.<br>11.01 Cable<br>11.03 Oblong element (probably boulder) partially covered by algae. Beside hollow fragment or intertwining rope. Between TA 128 and TA 121 (Figure 4.9) |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | | 11.14 Uncertain element. Plastic fragment.<br>11.18 Uncertain element between TA 104 and TA 110<br>11.22 Uncertain element (TA 104)<br>11.32 Uncertain element (probably abandoned net) of oblong shape covered by specimens of algae and nudibranch eggs. Probably TA 097 - A031 (Figure 4.10)<br>11.43 TA 099 not identified |
| ENV_ARCHEO TR04 | 11:55 | 12:30 | 021 (TD1)<br>022 (TD1)<br>024 (TD2) | Sandy sediment with bioturbation and with ripple marks due to currents.<br>12 Debris: Uncertain element, metal tubing and braided cable, uncertain whether TA 021 or TA 022 (Figure 4.11)<br>12.03 Another uncertain element, probably TA 022<br>12.07 Uncertain element (probably boulder) Perhaps TA 024.<br>No feedback trace SE.<br>12.17 Plastic fragment. Detour to E made: No match.<br>12.23 Plastic fragment<br>12.24 Fragment tube "C"<br>12.25 Other tube/cable fragments up to 12.28 |
| ENV_ARCHEO TR06 | 13:29 | 14:11 | 126 (TD1)<br>129 (TD1)<br>127 (TD2)<br>138 (TD1)<br>120 (TD1) | Sandy sediment with ripple marks due to currents. (Figure 4.12)<br>13.39 Pipeline<br>13.46 TA 127: probable fishing debris with floats<br>13.49 Tubular fragment<br>14.03 Plastic fragment |
| SSS_182 | 14:25 | 14:41 | 182 (TB3)<br>187 (TD1)<br>189 (TD2) | 14.27 TA 187: Rock. Another smaller one towards TA 182<br>14.35 Probable boulder corresponding to black trace between TA 182 and TA 189. Investigate in video the cracks and green part like metal. Visible part of a tube. |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| ENV_ARCHEO TR07 | 14:57 | 15:55 | 266 (TB3)<br>267 (TB1)<br>231 (TD1) | Sandy sediment with ripple marks due to currents.<br>15.01 TA 231 Not identified<br>15.02 Black plastic fragment<br>15.07 Fragment uncertain in algae (annular)<br>15.32 A36 Not identified<br>15.35 Fragment of black plastic and seaweed<br>15.37 Oblong fragment with concretions.<br>15.41 Pipe fragment.<br>15.43 Curved tubular fragment, algae specimens, white plastic fragment.<br>15.45 Abandoned fishing net, possibly corresponding dark trace between TA 267 and TA 266 MBES (Figure 4.13). White tubular fragment. Debris area, probably rigid (metal) semicircle structure. |
| ENV_ARCHEO TR09 | 16:48 | 17:16 | 319 (TD1)<br>312 (TD1)<br>313 (TD2)<br>295 (TD1)<br>301 (TD1)<br>302 (TD1)<br>272 (TD1)<br>278 (TD1)<br>292 (TD2)<br>304 (TD1)<br>330 (TD1) | Sandy sediment with ripple marks due to currents.<br>16.50 Fishing net probably TA 313<br>No other TA identified |
| ENV_ARCHEO TR17 PARTIAL | 17:48 | 17:56 | NA | Repeated the following day |


Figure 4.5: Sandy sediment with bioturbation (*Octopus vulgaris*)


Figure 4.6: Abandoned net with rests of bivalve molluscs, brown algae specimens and *Hippocampus* sp. (probably TA097 – A31)


Figure 4.7: Sandy seabed with bioturbation


Figure 4.8: Tire (probably TA 056)


**Figure 4.9: Oblong element (probably boulder) partially covered by algae. Beside hollow fragment or intertwining rope. Between TA 128 and TA 121**


**Figure 4.10: Uncertain element (probably abandoned net) of oblong shape covered by algae and nudibranch eggs. Probably TA 097 - A031**


Figure 4.11: Uncertain element, metal tubing and braided cable, uncertain whether TA 021 or TA 022

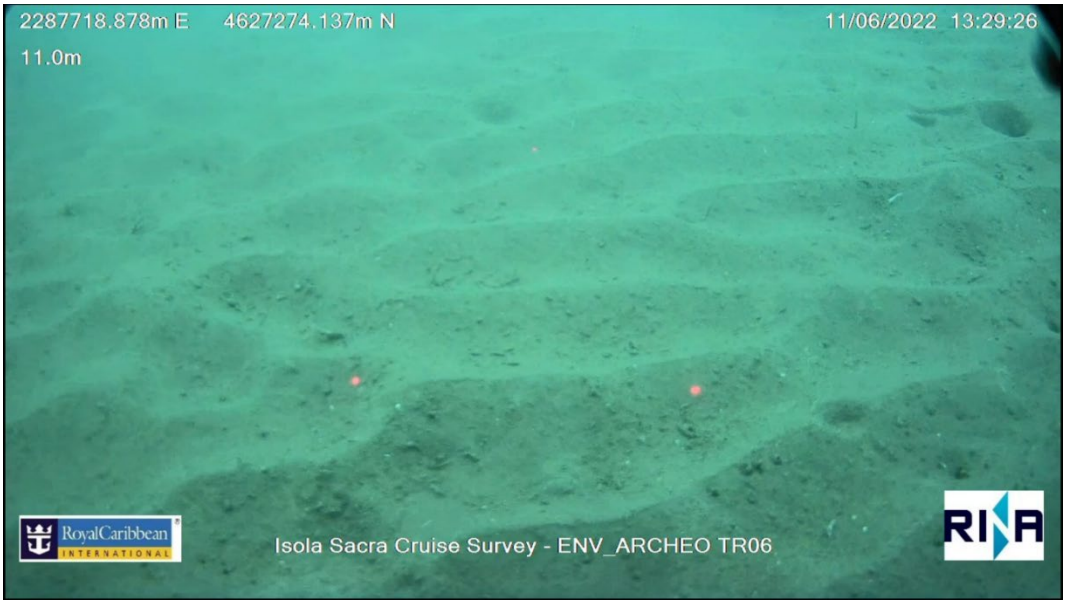


Figure 4.12: Sandy sediment with ripple marks due to currents


**Figure 4.13: Abandoned fishing net, possibly corresponding to MBES dark trace between TA 267 and TA 266**

### 4.4.5 12th June 2022

**Table 4.6: Investigated items 12/06/2022**

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| ENV_ARCHEO TR17 | 08:11 | 12:31 | 763 (TD2)<br>745 (TB2)<br>757 (TB1)<br>761 (TD1)<br>771 (TD1)<br>772 (TD1)<br>775 (TD1)<br>777 (TD2)<br>776 (TD1)<br>778 (TB2)<br>782 (TB2)<br>786 (TB2)<br>787 (TD1)<br>790 (TB2)<br>794 (TD3) | Sandy seabed covered by vegetal fragments with several Pennatulacea (Figure 4.14) eggs of Muricidae and Naticidae gastropods<br>8.13 No match A06<br>8.15 Observation TA 763 indicated as “Possible Wreck”: no match, not even in trace at O in MBES<br>8.30 Plastic fragment<br>8.33 TA 745 not identified<br>9.28 A18 no feedback, not even at MBES dark trace<br>9.33 Orange float.<br>9.34 Long square section element (probably of wood) with other debris<br>9.55 Another long element with a square section (probably wood) with other debris |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | | 9.57 Pipe fragment<br>10.02 TA 757 not identified<br>10.02 Tank with octopus<br>10.06 Rope or braided cable<br>10.08 in A17 hollow tubular fragment<br>10.14 No match for MBES trace between A17 and TA 761<br>10.17 TA 761Tubular fragment<br>10.24 TA 771 not identified<br>10.54 Tubular element (possibly wooden)<br>10.59 No match A45<br>11.03 Stone or pebble, unlikely TA 777<br>11.05 TA 775 is probably a dead body of a buoy<br>11.06 Pole between TA 777 and TA 776 (A46)<br>11.11 TA 776 not identified<br>11.12 No match at E of TA 776 (A46)<br>11.34 Tubular fragment between TA 776 and TA 778<br>11.35 Tubular fragment<br>11.39 TA 778 position only a slight relief<br>11.4 Uncertain element (probably modern tray)<br>11.47 TA 782 not identified<br>12.07 TA 786 not identified<br>12.10 TA 787: probable conical or cylindrical container of small dimensions, with annular traces on the outside, and opening of about 8 cm. Nearby tubular fragment (Figure 4.15).<br>12.27 TA 790 not identified<br>12.29. 5 cm curved fragment neck type. Other under vertical trace.<br>12.30 Eggs of Muricidae and octopus (*Octopus vulgaris)* |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | | 12.34 Tube fragment close to TA 794<br>12.36 TA 794 debris heap (probably corresponds to trace A16)<br>12.38 Boulder or more probably pole with concretions (Echinoidea and algae specimens); section circular, diam. ca 50, is probably TA 794; debris, plastic bottle, object with modern inscription, tray at the bottom (Figure 4.16). Probably TA 794 and A16 correspond. |
| ENV_ARCHEO TR16A - ENV_ARCHEO TR16B - ENV_ARCHEO TR16C - ENV_ARCHEO TR16D - ENV_ARCHEO TR16E - ENV_ARCHEO TR16F | 13:28 | 16:10 | 580 (TD3)<br>592 (TB2)<br>582 (TB2)<br>586 (TB3)<br>628 (TB3)<br>621 (TB1)<br>622 (TE)<br>644 (TB2)<br>646 (TB2)<br>647 (TB1)<br>650 (TB2)<br>664 (TB2)<br>676 (TE)<br>672 (TD2)<br>674 (TD1)<br>683 (TB3) | Sandy seabed with ripple marks due to currents<br>13.33 TA 580 not identified<br>13.44 TA 592 not identified<br>14.02 Structure apparently rocky, low, with fragments on the seabed. At about 1 m a quadrangular block, on the top covered by concretions; a metal grip ring is noted: like other boulders visible near the modern cliff. Probably TA 582 (Figure 4.17).<br>14.17 TA 586 Quadrangular mass like the preceding one, with oblong, whitish porous debris at the bottom.<br>14.37 Probable modern “Bruce” type anchor with concretions, probably TA628 (Figure 4.18).<br>14.43 Quadrangular mass probably. TA 621<br>14.47 TA 622 not identified<br>15.04 TA 644 not identified<br>15.11 TA 646 Boulder with concretions<br>15.13 TA 647 and TA 650 not identified<br>15.19 TA 664 probably boulder. MBES and SSS extended trace at S,TA 664 not identified<br>Visibility worsens |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | | 15.45 No match TA 672, TA 674, TA 676<br>15.45 Fragment of cloth.<br>15.49 Debris at pos. TA 683 (MBES and SSS traces not conspicuous)<br>15.50 TA 683: Fragments of large ropes or braided cables. Large portion of folded fishing net (Figure 4.19) with concretions.<br>15.55 Debris<br>15.58 Debris (oar fragment or small modern rudder)<br>TA 687 and TA 693 cancelled temporarily due to the danger of the presence of rocks and visibility. However, these are targets like TA 683.<br>16.12 Plastic tray<br>16.16 Squared boulder, just before TA 696 and TA 697 ( probably TA 697). No other finds (few debris)<br>16.22 No match TA 695 |
| ENV_TR10 | 16:48 | 17:15 | NO TARGET | Sandy seabed with ripple marks due to currents, Asteroidea specimen<br>No targets |
| SSS_232 | 17:37 | 17:46 | 232 (TE) | Sandy seabed with ripple marks due to currents<br>Target SSS232 not identified (despite SSS trace and MBES hull shape) |
| SSS_494 | 17:59 | 18:04 | 494 (TD3) | Sandy seabed with ripple marks due to currents<br>Target SSS494 (Possible Wreck) not identified |


Figure 4.14: Sandy seabed covered by with several Pennatulacea


Figure 4.15: TA 787: probable conical or cylindrical container of small dimensions, with annular traces on the outside, and opening of about 8 cm.

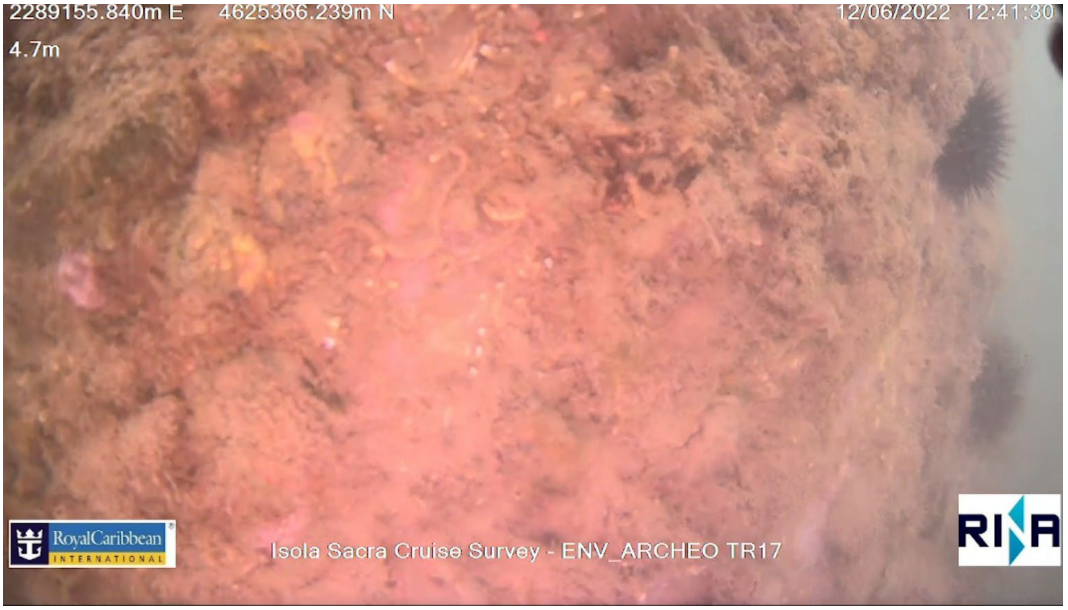


**Figure 4.16: Boulder or more probably pole with concretions (Echinoidea and algae specimens); section circular, diam. ca 50, is probably TA 794**


**Figure 4.17: Structure apparently rocky, low, with fragments on the seabed. At about 1 m a quadrangular block, on the top covered by concretions; a metal grip ring is noted: like other boulders visible near the modern cliff. Probably TA 582**


Figure 4.18: Probable modern "Bruce" type anchor with concretions, probably TA628


Figure 4.19: Large portion of folded fishing net

### 4.4.6 13th June 2022

Table 4.7: Investigated items 13/06/2022

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| ENV_TR13REP | 08:01 | 08:22 | 708 (TD1)<br>714 (TE)<br>717 (TE)<br>736 (TD1)<br>746 (TB1) | Sandy seabed covered by vegetal fragments with several Pennatulacea specimens (Figure 4.20), eggs of Naticidae gastropods and few scattered brown algae specimens<br>8.04 No match TA 708, 714, 717<br>8.22 TA 736 and TA 746 not identified |
| ENV_ARCHEO TR11 - ENV_ARCHEO TR11A - ENV_ARCHEO TR11B | 08:46 | 10:00 | 429 (TD1)<br>432 (TD2)<br>438 (TD2)<br>441 (TD1)<br>444 (TB2)<br>443 (TD1)<br>454 (TB2)<br>456 (TD1)<br>460 (TD2)<br>473 (TD1)<br>474 (TD1)<br>478 (TB1)<br>481 (TD1)<br>470 (TD1)<br>471 (TD1)<br>475 (TD1) | Sandy seabed with ripple marks due to currents, eggs of Naticidae gastropods (Figure 4.21), few scattered brown algae specimens<br>8.49 No match 4 TA 429 and TA 432<br>8.52 TA 438 not identified<br>8.55 Fragment of plastic cloth slightly S TA 441<br>8.58 TA 444 not identified<br>9.00 TA 443 not identified<br>9.03 TA 454 not identified<br>9.04 TA 456 not identified<br>9.20 TA 460 not identified<br>9.25.17 TA 470 and TA 474 not identified<br>9.27 TA 478, TA 481, TA 473, MBES trace not identified<br>9.30 TA 471 not identified<br>9.33 TA 475 not identified<br>09.46 MBES trace N TA 484 not identified<br>09.48 TA 484 not identified<br>09.50 A41 (MBES traces) not identified<br>09.53 TA 485 not identified<br>09.57 Plastic fragment |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | | 09.59 Slit on the seabed |
| ENV_ARCHEO TR08 - ENV_ARCHEO TR08A | 10:18 | 11:17 | 416 (TD2)<br>411 (TD1)<br>398 (TD2)<br>403 (TD1)<br>395 (TD1)<br>391 (TD1)<br>361 (TD2)<br>375 (TD1)<br>383 (TD1)<br>392 (TE)<br>381 (TB1)<br>380 (TB2)<br>386 (TD1)<br>385 (TB1)<br>379 (TB1)<br>387 (TD1)<br>390 (TB2)<br>397 (TE) | Sandy seabed with ripple marks due to currents (Figure 4.22), few scattered brown algae specimens<br>10.19 TA 416 not identified<br>10.22 TA 411 not identified<br>10.25 MBES traces SE TA 411 not identified<br>10.26 Branch, fragments of white plastic<br>10.30 TA 398, TA 403 not identified<br>10.34 TA 395 not identified<br>10.37 TA 391 not identified<br>10.59 TA 61 not identified<br>11.02 TA 375 not identified<br>11.05 TA 380, TA 381 not identified<br>11.07 TA 392 not identified<br>11.10 Sandy "steps" corresponding to MBES traces (SSS light spot), probably due to different grain size of the sediment<br>11.11 White element<br>11.14 TA 379, TA 385, TA 387, TA 390 not identified<br>11.16 TA 386 not identified |
| ENV_ARCHEO TR14 - ENV_ARCHEO TR14A | 11:36 | 12:31 | 726 (TB3)<br>728 (TD1)<br>730 (TD1)<br>732 (TD1)<br>740 (TD1)<br>743 (TD1)<br>747 (TD1)<br>752 (TD1)<br>753 (TE)<br>754 (TD1)<br>755 (TD1) | Sandy seabed with ripple marks due to currents<br>11.39 TA 726 not identified<br>11.40 Plastic fragment A48<br>11.41 TA 726, TA 730, TA 732 not identified<br>11.55 large cloth scattered and semi-sanded in A48, which should constitute the MBES trace (ca 7 x 7 m), and probably TA 726, TA 728, TA 730, TA 732. Some Asteroidea and remains of bivalve |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | 756 (TD1)<br>764 (TD1) | molluscs found on the cloth (Figure 4.23).<br>12.02 TA 740 not identified<br>12.05 TA 743 not identified<br>12.16 TA 747 not identified<br>12.20 No match for MBES trace O of TA 754<br>12.22 TA 753, 754, TA 755, TA 756 not identified<br>12.27 TA 764 not identified<br>12.31 Branch with algae specimens |
| ENV_TR05REP | 13:30 | 13:59 | 068 (TE)<br>083 (TB1)<br>071 (TD1)<br>074 (TD1)<br>082 (TD1)<br>078 (TD2) | Sandy seabed with bioturbation<br>13.32 A24 (SSS trace) and TA 068 no match<br>13.37 No match TA 083<br>13.39 Pipeline (Figure 4.24), aluminium bag<br>13.50 TA 071 not identified<br>13.53 TA 82 and A23 not identified<br>13.54 Flat fragment TA 074<br>13.59 TA 057 not identified<br>TA 078 Tire |
| ENV_TR12REP-ENV_TR12REPA | 14:32 | 15:45 | 691 (TE)<br>689 (TD1)<br>692 (TD1)<br>694 (TD2)<br>685 (TD1)<br>681 (TD1)<br>682 (TB1)<br>684 (TE)<br>675 (TD2)<br>668 (TD2)<br>669 (TD2)<br>671 (TD2) | Sandy/silty seabed with bioturbation<br>Trace E of the TR in MBES, shift in SSS, checked<br>14.33 No match TA 691<br>14.44 No match TA 689<br>14.47 TA 692 Rigid semi-circular structure (hollow globular object upon first examination) approx. 50 cm wide (Figure 4.25)<br>Probable grouping of debris including TA 694<br>Very poor visibility |

| ID | STARTING TIME | ENDING TIME | TA | Comments |
|---|---|---|---|---|
| | | | | 15.31 Very poor visibility on TA 681, TA 682, TA 684 but no match<br>15.34 TA 675 not identified<br>15.42 TA 668 not identified<br>15.45 TA 669, TA 671 (MBES trace) no match |
| ENV_TR15REP | 16:06 | 16:26 | 809 (TD1)<br>810 (TD1) | Sandy seabed with ripple marks due to currents, Decapoda (*Liocarcinus depurator*), (Figure 4.26), eggs of Naticidae gastropods<br>16.19 No match TA 809<br>16.25 No match TA 810 |
| SSS_811 | 17:37 | 17:43 | 811 (TD3) | Sandy seabed covered by vegetal fragments<br>Various wood, plastic debris.<br>17.40 TA 811 Concrete pole identified (Figure 4.27). |
| SSS_808 | 17:47 | 17:53 | 808 (TB2) | Sandy seabed covered by vegetal fragments, poor visibility<br>17.51 Various debris (Figure 4.28).<br>TA 808 Not directly confirmed, probably small relief debris and algae<br>17.52 Tubular fragment |

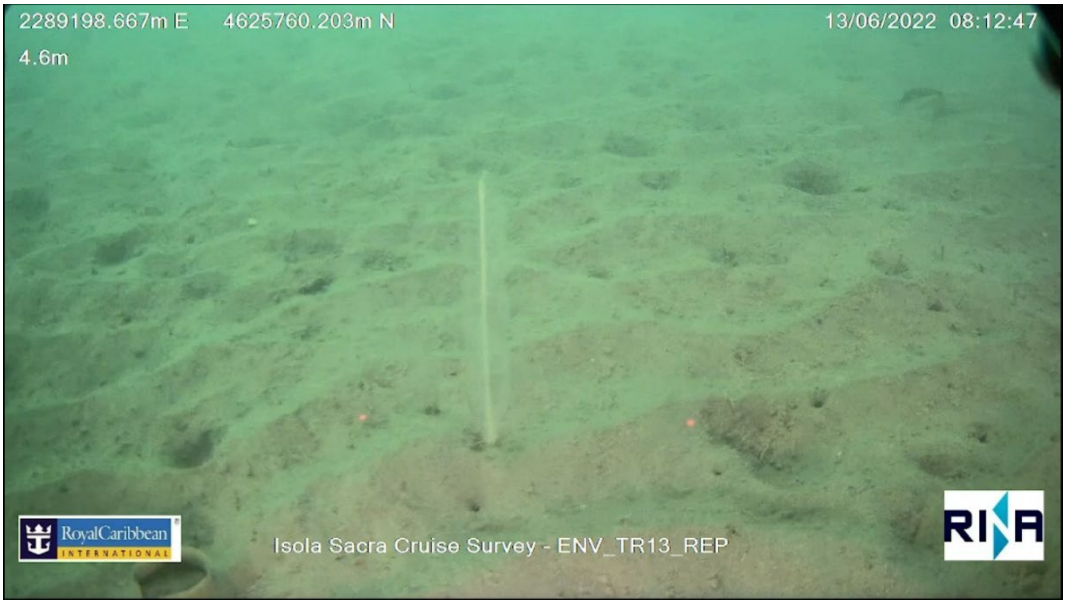


Figure 4.20: Pennatulacea on sandy seabed


Figure 4.21: Eggs of Naticidae gastropods


Figure 4.22: Sandy seabed with ripple marks


Figure 4.23: Large cloth scattered and semi-sanded in A48, which should constitute the MBES trace (ca 7 x 7 m), and probably TA 726, TA 728, TA 730, TA 732. Asteroidea and remains of bivalve molluscs found on the cloth.


Figure 4.24: Pipeline

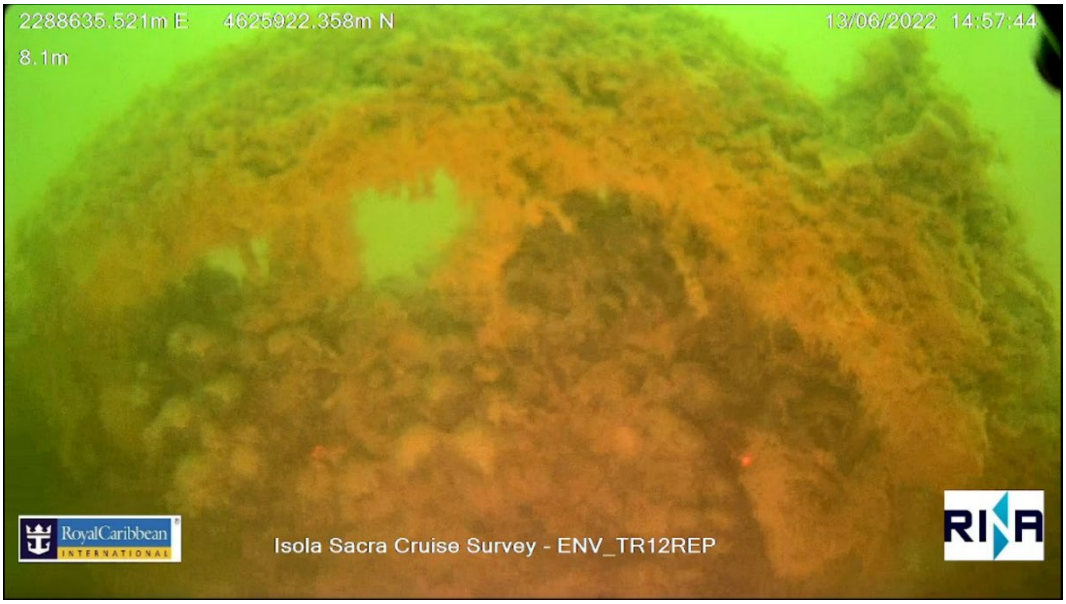


Figure 4.25: TA 692: rigid semi-circular structure approx. 50 cm wide


Figure 4.26: Sandy seabed with ripple marks due to currents, Decapoda specimens (*Liocarcinus depurator*)

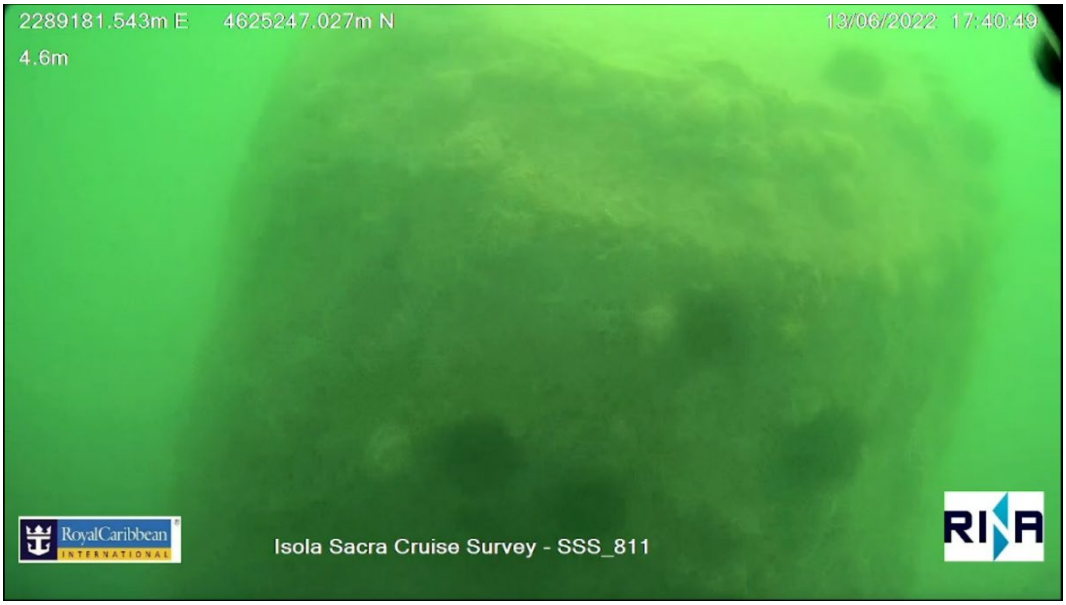


Figure 4.27: TA 811 pole with concretions (Echinoidea and algae specimens)


Figure 4.28: Sandy seabed covered by vegetal fragments, poor visibility, various debris

# 5 PRELIMINARY RESULTS

Inspections were performed in good weather and visibility conditions that allow the survey team to acquire good quality data.

From an archeological point of view the presence of ancient artifacts, of strictly archaeological interest, was not detected either preliminarily or from direct observation of the seabed with the ROV.

The percentage of TB3 Targets (larger size) investigated was 46%

The percentage of TD3 Targets (larger size) investigated was 86%

The percentage of TB2 and TD2 Targets (medium size) investigated was 33%

The percentage of TB3 and TD3 Targets (larger size) investigated was 60%.

The few artifacts observed appear to be related to recent elements pertinent to the nautical and fishing activities in the area, as well as rocks from the artificial reefs, concrete poles, and plastic debris.

From an environmental point of view the only observed species to be reported are some specimens of Pennatulacea (*Virgularia mirabilis*) and two specimens of *Hippocampus* sp. The Pennatulacea *Virgularia mirabilis* is usually found at depths greater than 30 m in cold waters and is considered by the IUCN[1] as a vulnerable species, but conservation measures are foreseen only for the populations of the Gulf of Naples and the Adriatic Sea. *Hippocampus* sp. (probably *Hippocampus guttulatus*) is considered by the IUCN[2] as almost threatened, the species is included in Annex II SPA / BIO of the Barcelona Convention, in Annex II of the Bern Convention and is included in the CITES Convention.

A more detailed description of the species present in the area will be provided following the review of the video images.

The seabed is characterized by sand with different grain size and silt percentage depending on the distance from the coast. The areas with different acoustic responses on SSS mosaic result to be characterized by different grain size and presence bioturbated areas (probably crustaceans shelters).

Several eggs of gastropods were observed, this is normal considering the investigation period.

The most abundant organisms observed were of the order Decapoda and Pennatulacea.

No seagrasses were observed.

Data will be reworked as recorded video will be further analyzed in deep in order to better describe targets nature and species identification. Seabed features identified through visual inspections will be integrated with sediment chemical, physical and biological analysis results to fully describe habitat and biocenosis in the project area.

*******

[1] http://www.iucn.it/scheda.php?id=1391685060

[2] http://www.iucn.it/scheda.php?id=1852858488

# Appendix A

# Technical Data Sheets

**Doc. No. P0031340-1-H2 Rev. 00 - 04 July 2022**

**VEGA UNO**
**Nave per ricerca scientifica e tecnologica**

| | | |
|---|---|---|
| Lunghezza F.T. | 15,9 m | Length overall |
| Larghezza F.O. | 5,1 m | Width overall |
| Immersione media | 1,65 m | Draugth |
| Stazza lorda | 27,5 t | Gross tonnage |
| Velocità | 18 kn | Maximum speed |
| Classe | *100 A. 1.1. nav.s. st. nav.med. | Classification |
| Compartimento | Napoli | Port of registry |
| Matricola | Nave maggiore N.ro 1849 | Official number |

INFORMAZIONI GENERALI

La nave oceanografica Vega Uno, varata nel 1991 dal cantiere Stella Polare, è un'imbarcazione adatta a ricerche ambientali e geofisiche, per campagne di breve e media durata. L'utilizzazione del tender presente a bordo permette di poter operare fino alla battigia, mentre le dotazioni nautiche e di sicurezza garantiscono la piena operatività in mare aperto in ambito nazionale.
L'imbarcazione è dotata di due cabine singole e di due cabine doppie per ospitare i ricercatori e i membri dell'equipaggio con eccellenti dotazioni di comfort (aria condizionata, doppi servizi, locale cucina). La spaziosa coperta, equipaggiata di portale e doppio verricello, permette di svolgere le operazioni di messa a mare e di recupero degli strumenti oceanografici in condizioni ideali, mentre sul ponte principale è allestito un laboratorio per lo studio dei campioni prelevati. La precisione del posizionamento è garantita dall'utilizzo di GPS differenziale e strumentazione di ultima generazione.
L'imbarcazione è inoltre equipaggiata con celle frigorifere per la conservazione dei campioni.

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# STARFIX NAVIGATION SUITE

The new system is also PC based, but uses Microsoft Windows 95 and NT for its operating system, developed for 32-bit operation. The package is modular and can have a number of applications running simultaneously over a LAN or WAN.

The Starfix Navigation Suite comprises the following components:

- Nav - Realtime navigation, display, and data entry using GIS database engine.
- Seis - Integrated navigation package interchangeable with Nav, specifically designed for hydrographic and seismic applications.
- OBS - Ocean Bottom Seismic module and processing system to work in conjunction with Starfix.Nav.• Bullet point item number six

Figure 1: [Insert Starfix Navigation Display Console Figure Caption]

The following data management software tools and hardware are used with each of these packages:

- Message Manager – Data distribution system.
- Control - Toolbar that launches and closes all the applications.
- IOWIN – Interfacing application to load device drivers.
- OiSTAR fieldbus – Interfacing modules for connecting asynchronous serial devices.
- Time - Synchronisation of ime ove r a LAN or WAN using external time inputs.
- Alarm - Processing and display of Alarms and Warnings.
- Logging - Control of logging, playback and filters to UKOOAand other formats.
- Print - Spooling of printouts from the various applications.
- Plot - Realtime positioning output to a plotter.

The following modules can be utilised either on the same computer as the main package or on another computer linked by local or wide area network:

- MRDGPS - Multi Reference Differential GPS positioning system.
- QCPlot - QC display and printing system for Time Series Plots, Statistics, and Histograms.
- Anchors - Control of tugs and remote vessels.
- 3DNav/Hydrovista – Display module for 3D views and CAD calculations.

- COP - Configurable Output Module for user defined displays, printouts, and logging.
- RGPS - Relative GPS module used for tailbuoy or remote vessel tracking.
- USBL - Ultra Short Baseline calibration and positioning.
- SPA - Structural Positioning Application used for positioning of jackets, templates, pipelines, and ROVs.
- Acoustics - Calibration and positioning using Sonardyne LBL and LUSBL acoustics.
- ADV - Data processing of altitude and depth data from Chance's DW-ADV system.

## Starfix.MM

The Message Manager (MM) is the heart of the system. Applications and device drivers publish their data messages to the MM, which in turn passes the data to any application that has subscribed to the data message. Each machine on a LAN will run its own MM which passes data between machines making it available for any application running on that machine.

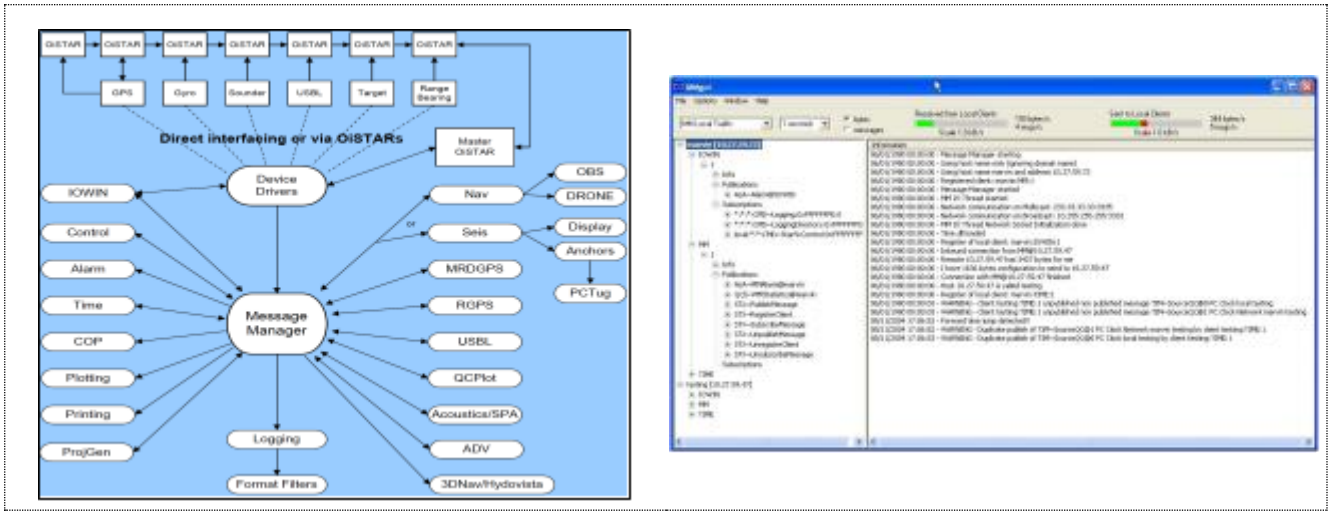



Figure 2: Message Manager (MM) messages

## Starfix.CONTROL

The Control program is the launching pad for the Starfix Navigation Suite. Its functions include:

- Starts all applications as per previous use.
- Stays as Toolbar for launching any of the installed applications and for switching between running applications.
- Closes all applications.
- Day / Night text colour control.

The Control program is used to open and close all programs within the Starfix Navigation Suite and to simplify the startup procedure for each computer on a network.

## Starfix.IOWIN

The Starfix.IOWIN application is the controller for input and output of data, eithe r via RS232, ethernet, or hardware devices, with the user assigning device drivers to these. Individual drivers are created for e ach device that is interfaced which includes GPS receivers, gyros, echo sounders, USBL systems, target systems, and range bearing systems

## Starfix.TIME

Timing is critical for synchronization of all input data. This is achieved by the Time application using time input devices, such as GPS receivers as a time source. Multiple sources can be used and each will be give n a priority according to its validity. For example, a 1 PPS input from a GPS receiver will be given the highest priority when compared to a time received in a NMEA position input that has some latency. Automatic switching between sources is available should one system fail. Smoothing is applied to minimise any jitter in

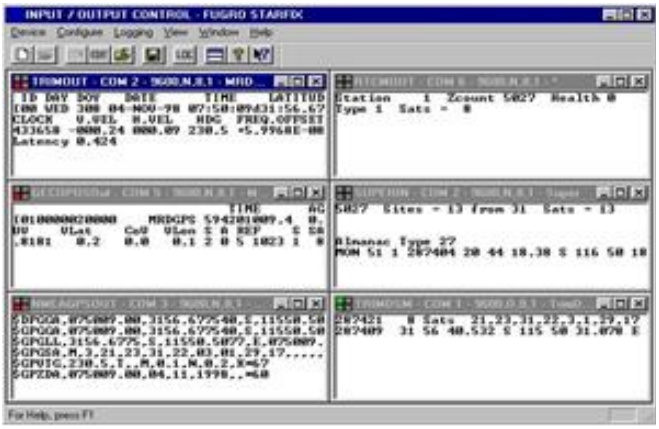



Figure 3: INPUT/OUTPUT (IOWIN) Control Module

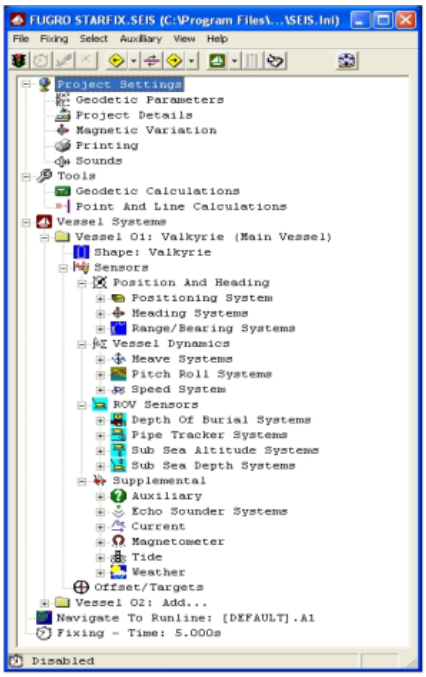



Figure 4: SEIS Control Module

# STARFIX-STARPACK

## StarPack Platform

The StarPack unit consists of a survey grade GNSS combined L-band receiver and powerful processor, running Linux multitasking operating system. The receiver is capable of tracking all current satellites (GPS, GLONASS) and is Galileo ready. StarPack can be extended with a second GNSS card (in the same unit), to provide accurate, GNSS derived heading. In addition to GNSS observations, the second card provides also L-band functionality, creating an independent source of corrections for backup.


Figure 1: StarPack Unit

The combination of receiver and processor provides robust multiple simultaneous precise position calculations and extensive QC. For maximum system reliability, the internal software is embedded on a flash memory. System can be controlled and configured via the front panel, web interface or a serial port.

The StarPack is equipped with four serial ports on the rear panel and LAN interface to provide a multitude of outputs to the user and to read multiple correction sources (in addition to those from the integrated receiver(s)). Raw GNSS data and corrections are continuously logged internally and can be exported to RINEX to enable high quality support and back-up. User can download this data and send it to Fugro's development centers for re-processing. Additional user defined output can be configured for automatic logging. Firmware can be upgraded using the web interface or using a USB stick at the front panel.

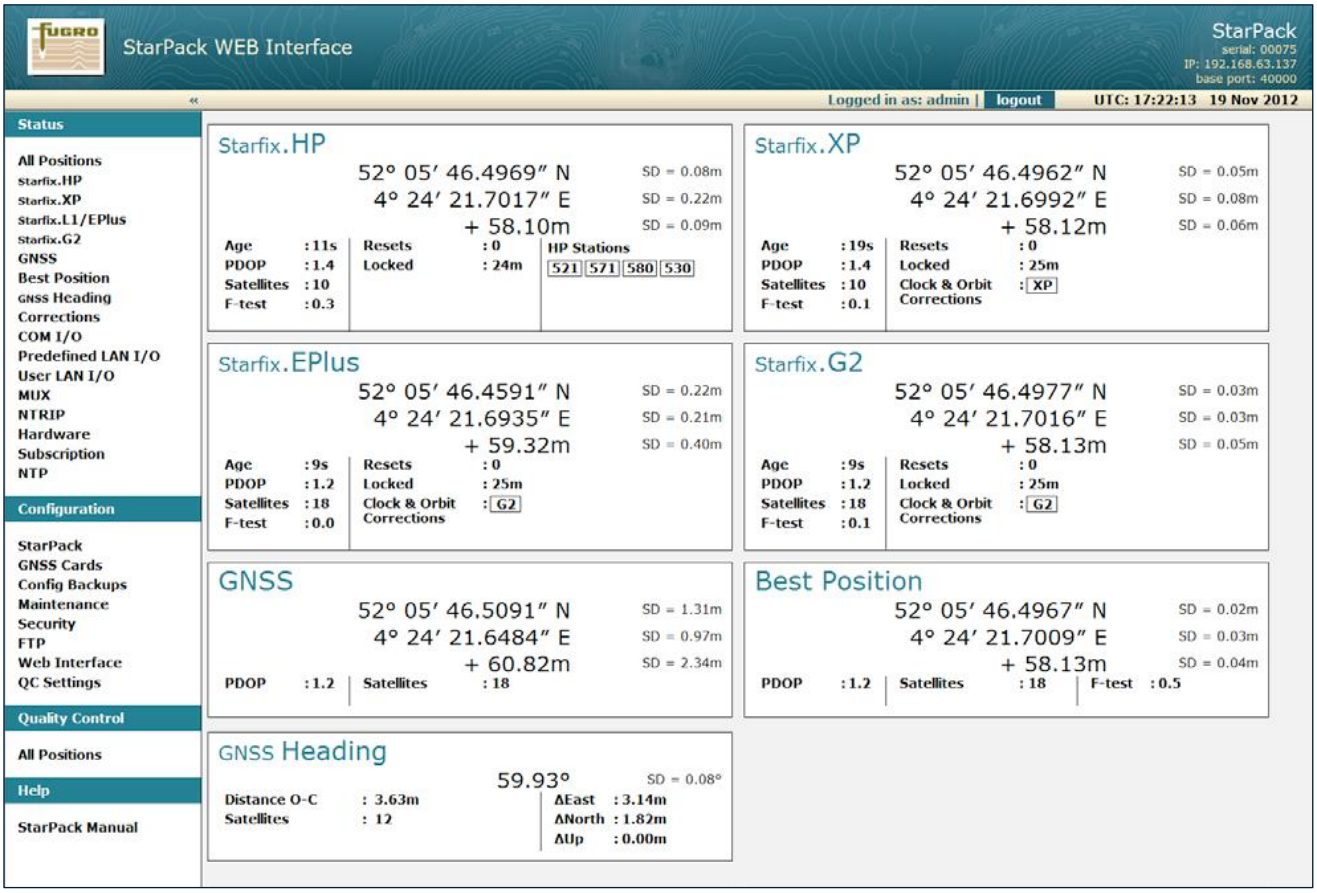
## Positioning and Heading solutions

The embedded processing software of the StarPack GNSS receiver provides multiple configurable simultaneous precise positioning solutions, including G2.

- Four independent correction sources
  - Starfix.G2
  - Starfix.XP
  - Starfix.HP

- Starfix.L1

- Five solutions: Starfix.G2, Starfix.XP, Starfix.HP, Starfix.EPlus and Starfix.L1
- New “Best Position” solution, combining all available solutions in to one, using proper weighting “Best Position” provides increased availability and better accuracy.
- A Heading solution between two GNSS antennae, in combination with a second GNSS card (in the same or another receiver).




## StarPack applications

- Accurate height for tidal corrections and heave compensation
- Accurate position for seabed mapping surveys
- Accurate vertical reference for out of straightness pipeline surveys
- Accurate (instantaneous) heading source (in combination with a second GNSS card)
- Stable position for station keeping on DP vessels
- Accurate relative positioning of structures
- Automated vessel guidance

## NTP support

The StarPack contains an NTP (Network Time Protocol) server, providing a time accuracy of 500 µs or better with a convergence time after power-on within several minutes.
Data inputs to the Starpack from a PC are considered advanced CODEC features and are not supported at this time.

The StarPack can handle two formats: RTCM or “Fugro”. Fugro format is the format from the Starfix network, also called SuperCompressed in Starfix.IOWIN.

## Output Data Formats

This section describes the various data formats the equipment OUTPUTS to other equipment. These outputs are typically interfaced to Starfix.NG which decodes and consumes the data.


Figure 2: StarPack Web Interface

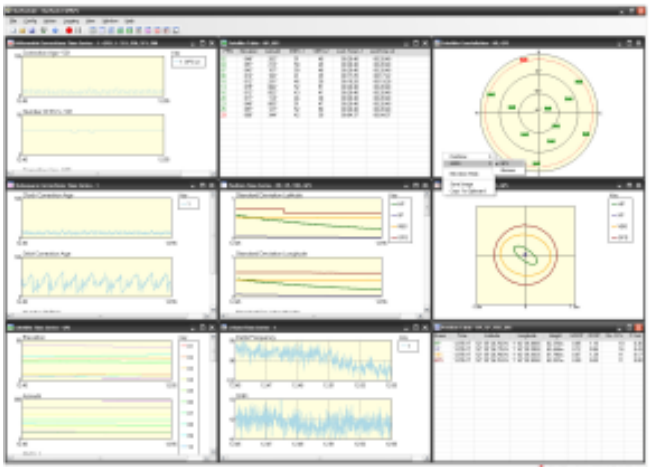


Figure 3: StarPack-QC running in real-time

## NTRIP client

The StarPack contains also NTRIP (Networked Transport of RTCM via Internet Protocol) client. When internet connection is available StarPack can be connected to Fugro’s (or thirdparty) corrections servers providing additional, independent from L-Band, corrections backup.

## Quality control

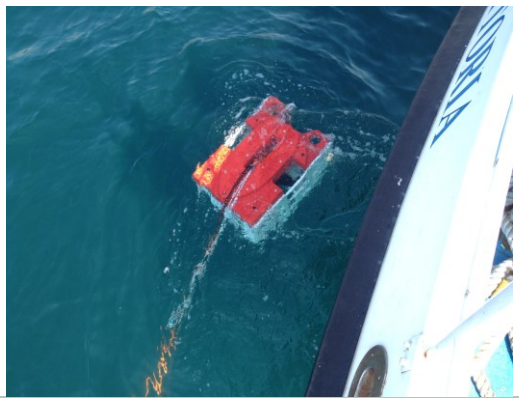
Extensive quality control is provided through StarPackQC, a stand alone PC based application, or on web interface, Quality control parameters indicating precision, reliability and availability can be visualized for estimated positions as well as for corrections and individual satellites.

## Technical Specifications

| | |
|---|---|
| GNSS hardware engine | TrimbleBD982 with two antenna inputs: 220channel GPS/ GLONASS, Galileo/BeiDou available with software option upgrade |
| | Single or dual NovAtel OEMV3: 72 channel GPS/GLONASS board |
| | TrimbleBD960: 72 channel GPS/ GLONASS board (no longer manufactured, but serviceable) |
| Corrections | Integrated receiver for Starfix differential and orbit/clock corrections |
| Processor | Intel Pentium III, embedded Linux operating system |
| Data rate | 1 Hz - 5Hz |
| Data storage | 10 days, raw and correction data (1 Hz) on internal disk |
| Size | 245 x 60 x 195 mm (W x H x D) |
| Weight | 2 kg |

| | |
|---|---|
| **Input voltage** | 80 – 250 VAC, 40 – 60 Hz |
| **Input/output** | 4 RS232 ports, LAN with more than 30 configurable ports, 1 PPS |
| **Operating temperature** | -20°C – + 50°C |
| **Storage temperature** | -40°C – + 85°C |
| **Humidity** | 95% non-condensing |
| **Compliant** | EMC 2004/108/EC (EN60945:2002) 2011/65/EU(RoHS 2) |

| Service/ solution | Accuracy (hor. 95%) | System | Correction data | Coverage |
|---|---|---|---|---|
| Starfix.G2 | 0.1m | GPS GLONASS | Clock and orbit corrections | Global |
| Starfix.XP | 0.1m | GPS | Clock and orbit corrections | Global |
| Starfix.HP | 0.1m | GPS | Ionosphere-free carrier phase corrections from multiple reference stations | Regional <1000km* |
| Starfix.EPlus | 1m | GPS GLONASS | Clock and orbit corrections | Global |
| Starfix.L1 | 1.5m | GPS | L1 pseudo range corrections from multiple reference stations | Regional <500km* |
| Best Position | 0.1m | GPS GLONASS | All available correction data | Global |
| Heading | Better than 0.1° for baselines longer than 3m | GPS GLONASS | | Global |

| | |
|---|---|
| Nome | **REMOTE OPERATING VEHICLE**<br>**(ROV – POLLUX III)** |
| Descrizione | **Dimensioni**<br>Lunghezza 910mm<br>Larghezza 660mm<br>Altezza 560mm<br>Peso 70-90 kg<br>**Equipaggiamento**<br>Sensori di Navigazione Bussola e sensore elettronico di pressione (profondimetro)<br>Telecamera a colori full HD comandabile da superficie, Zoom manuale, Illuminatori 2 lampade a led a intensità regolabile (max 20 W ciascuna), Sistema di controllo/alimentazione portatile in valigetta stagna con monitor LCD<br>Accessori: Benna/Pinza comandabile dalla console, installabile orizzontalmente o verticalmente, Sistema Sonar<br>POD in alluminio per alloggiare fotocamere, telecamere e camcorder aggiuntivi controllati da console<br>Ombelicale: Materiale Kevlar, Portante 500 kg di resistenza allo strappo, Lunghezza 100 e 300 m<br>Motori: 4 motori a 24 V, 2 longitudinali + 2 trasversali compensati a liquido<br>Prestazioni: Profondità operativa 300m, spinta Avanti e Indietro 15 kg, Laterale/Verticale 5 kg<br>Funzioni Auto Depth e Auto Heading con bussola elettronica e misuratore di velocità angolare, Trim su assi X e Y<br>  <br>  |
| Servizi per cui viene utilizzata | Lo strumento è utilizzato per la prospezione visiva dei fondali attraverso un cavo comandato da bordo che guida il veicolo subacqueo e può operare fino ad una profondità massima di 300 m |
| Contatti | Fabio Conversano<br>Tel. +39 081 5833357<br>e-mail: fabio.conversano(at)szn.it |

# TrackLink 1500

## Integrated USBL Tracking and High Speed Acoustic Communication Systems

### Highly Robust , Accurate and Cost Effective

### The World's Best Selling USBL Acoustic Tracking Systems

The TrackLink 1500 systems are USBL acoustic tracking systems with fully integrated high speed acoustic communication capability. Capitalizing on its benchmark **Broadband Acoustic Spread Spectrum (BASS)** technology, LinkQuest provides the end users with solutions for underwater tracking and communication at sharply reduced cost and increased robustness. An extensive line of models are available to suit the users' specific application and budget constraint.

Since their introduction in early 2002, the TrackLink acoustic tracking systems have quickly become the best selling USBL tracking systems in the world. The TrackLink 1500 systems, sold to more than 12 countries in less than a year, have become the world's primary choice for tracking underwater vehicles and objects in water depth of less than 1000 meters.

The cost of a complete system, including a ship mounted transceiver, a transponder, the PC tracking software, a 70 foot cable and a transit case, starts from 15,000 US dollars.

**TrackLink 1500LC**

*This system is a low cost yet highly robust system. This system brings the convenience of an USBL system to a large number of users who typically do not have the budget for an expensive USBL tracking system.*

**TrackLink 1500MA**

*This system is a cost-effective, medium accuracy tracking system. The accuracy of the system is 1 degree. The TrackLink 1500MA System provides a highly robust solution to cost conscious users who require improved positioning accuracy.*

**TrackLink 1500HA**

*This system is a high accuracy USBL tracking system. The accuracy of the system is 0.25 degree.*

## Main Features

- Sharply reduced cost to end users and improved system robustness.
- Utilize LinkQuest's benchmark **Broadband Acoustic Spread Spectrum (BASS)** Technology.
- Strong rejection to multipaths and ship noise.
- Integrated with LinkQuest's most advanced high speed acoustic communication modems.
- Advanced power-efficient DSP technology for transponders and USBL transceiver.
- PC Windows tracking software. Interface directly to the transceiver. No need for a heavy proprietary deck unit.
- Small and light weight transceiver for ease of installation on a ship.

## System Specifications

- Positioning Accuracy:
  1500HA: 0.25 degree (better than 0.5% of slant range)
  1500MA: 1 degree (better than 2% of slant range)
  1500LC: 3 degrees (better than 5% of slant range)
- Slant Range Accuracy: 0.20 meter
- Targets Tracked: 16
- Operating Frequency: 31.0 to 43.2 kHz
- Operating Beamwidth: 120 to 150 degrees
- Transmit Mode Power Consumption: 10 Watts
- Receive Mode Power Consumption: 1.6 Watts
- Working Range With Ship Noise: up to 1000 m
- Maximum Transponder Depth: up to 1500 m
- Dimension: 12.6 cm (diameter) x 24 cm
- Operating Temperature: -5 to 45 ˚C
- Storage Temperature: -25 to 75 ˚C
- Weight Out Of Water: 3.5 kg
- Weight In Water: 1.2 kg
- RS-232 Configuration: 9600 baud, 1 start bit, 1 stop bit, no parity bit, and no flow control
- Optional High Speed Acoustic Modem Data Rate: up to 19,200 baud
- Acoustic Modem Operating Frequency: 26.0 to 45.0 kHz

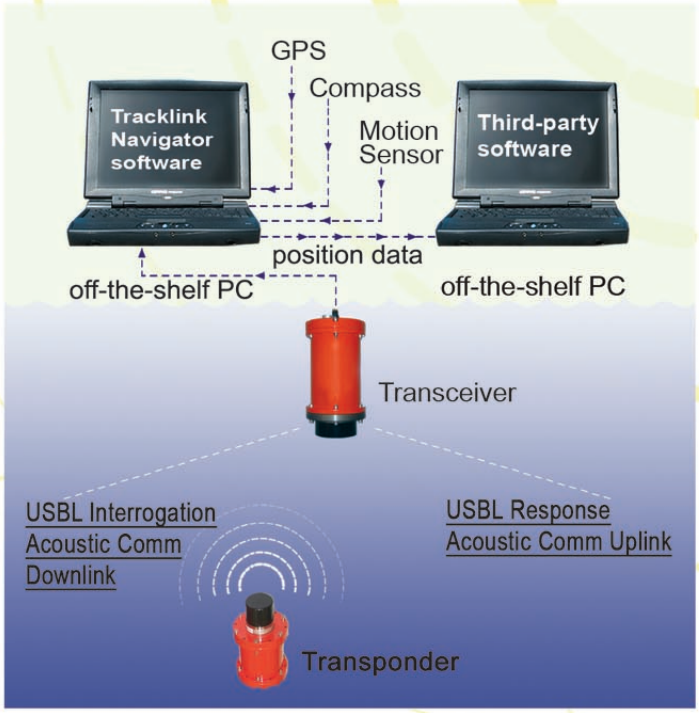

# LinkQuest Inc.

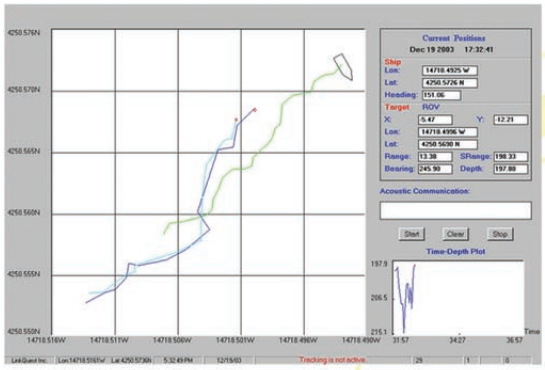
***6749 Top Gun Street, San Diego, CA 92121, USA Tel: (858) 623-9900, 623-9916 Fax: (858) 623-9918***
***sales@link-quest.com http://www.link-quest.com***

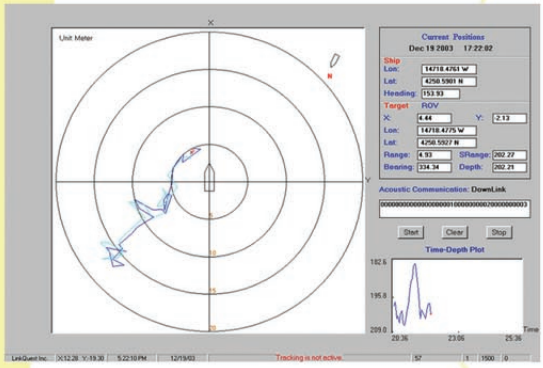
# TrackLink 1500 Transceiver And Software

## Applications

- ROV Tracking and Navigation
- AUV Tracking and Communication
- Manned Submersible Tracking and Communication
- Survey Towfish Tracking
- Underwater Construction
- Diver Navigation and Tracking
- Moored Instrument Relocation



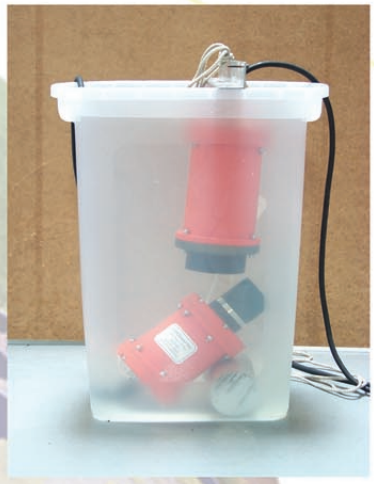


The TrackLink Navigator Windows software integrates the TrackLink USBL transceiver with the ship's GPS/DGPS, compass and motion sensor using serial communication. The software displays the positions of the ship and the targets in various plots and textual displays. It also interfaces to other computers for acoustic communication data and sends positioning data to other computers in a predefined format.

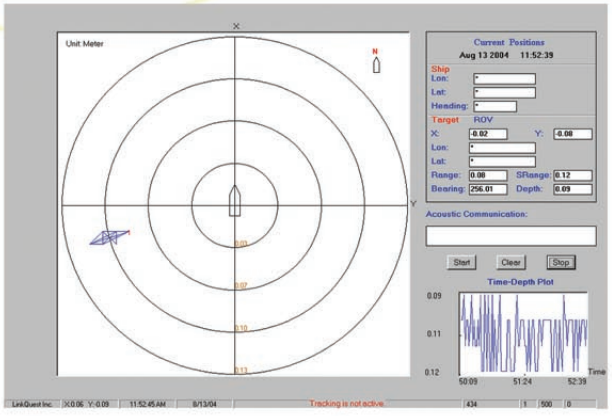
The TrackLink software works smoothly with third party software such as HYPACK™, WinFrog™ and HYDROpro™.

The TrackLink Navigator software runs on any off-the-shelf PC. No cumbersome "Deck Unit" is needed to operate the system. The software is simple to use and highly robust. A few clicks from the mouse will start your tracking session smoothly.

The industry's smallest and lightest USBL transceiver



The industry's only USBL systems capable of tracking targets in highly challenging acoustic environments inside small containers



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# TrackLink 1500 Series

## Intelligent, Power Efficient Transponders

*(left to right) TN1522 Responder, TN1505B and TN1505BR Transponders, TN1510A, TN1510B and TN1510C Transponders.*

A wide range of transponders are available for the TrackLink acoustic tracking systems. All the transponders use state of the art DSP to manage the power usage efficiently. The **Broadband Acoustic Spread Spectrum** technology used by the TrackLink system further decreases the power consumption. The DSP is programmed to stay in the standby mode most of time and wakes up to intercept acoustic signal periodically. After the transponder is awaken by the surface TrackLink transceiver, it will be transitioned to the active mode and ready to respond to surface transceiver interrogation. The transponder will go to the standby mode after a prolonged period with no signal reception.

Each transponder has 8 configurable addresses stored in the flash memory and the user can conveniently use the RS232 interface to configure the addresses and other parameters. TN1510 is a high power omni-directional transponder. It uses addresses from 1 to 8. It has comprehensive integrated acoustic communication functions. TN1505 is a high power compact omni-directional transponder. It uses addresses from 9 to 16.

Model A (e.g., TN1505A) is a compact transponder with no batteries. Models B and C for the TN1505 transponder use alkaline AA battery cells. Model B for the TN1510 transponder is equipped with alkaline C cells for medium term field use. Model C for the TN1510 transponder is equipped with alkaline D cells for long term field use. All transponders operate at frequency band from 31.0 to 43.2 KHz.

TN1510 transponder/responders have a high power option which increases the transmit power by 6 dB. This option can be useful for long-range high noise environments. The letter "H" following the model number, e.g. TN1510BH, indicates the transponder has the high power option.

All models also have a remote transducer option. With this option, the transducer is connected to the electronics housing by a cable. The letter "R" following the model number, e.g. TN1505BR, indicates the transponder has the remote transducer option. All transponders can be configured to act as a responder. All internally powered transponders can also be powered externally. If the external power is cut off, the transponder will automatically switch to use the internal battery.

### *TN1505*

Transmit Power: 25 Watts
Beamwidth: omni-directional
Depth Rating: 500 m

**1505A:**
Dimension: 25 cm x 6.4 cm (d)
Weight in Water: 0.6 kg
Weight out of Water: 1.4 kg
Input Voltage: 12 to 24 v

**1505B:**
Dimension: 30 cm x 6.4 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 1 year
Active Responding Time: 8 x 10 hours
Weight in Water: 0.86 kg
Weight out of Water: 1.77 kg
Input Voltage: 18 to 24 v

**1505BR:**
Dimension: 24 cm x 6.4 cm (d)
Weight in Water: 0.65 kg
Weight out of Water: 1.45 kg

**1505C:**
Dimension: 43 cm x 6.4 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 2 years
Active Responding Time: 8 x 30 hours
Weight in Water: 1.2 kg
Weight out of Water: 2.4 kg
Input Voltage: 18 to 24 v

### *TN1510*

Transmit Power: 32 Watts
Beamwidth: omni-directional
Depth Rating: 1500 m

**1510A:**
Dimension: 23 cm x 12.6 cm (d)
Weight in Water: 1.4 kg
Weight out of Water: 3.2 kg
Input Voltage: 12 to 24 v

**1510B:**
Dimension: 41.3 cm x 12.6 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 10 months
Active Responding Time: 8 x 25 hours
Weight in Water: 2.0 kg
Weight out of Water: 5.2 kg
Input Voltage: 22 to 24 v

**1510C:**
Dimension: 46 cm x 12.6 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 20 months
Active Responding Time: 8 x 50 hours
Weight in Water: 2.8 kg
Weight out of Water: 6.8 kg
Input Voltage: 19 to 24 v

**Options:**
Integrated Acoustic Modem
High Power

The omni transponders and responders are also available in various special models. Contact LinkQuest for more details.

# TrackLink 1500 Systems Set Enviable Track Record Worldwide

***Fugro Chance, Fugro Survey B.V., Fugro Topnav S.A.S., Fugro Geonics, Fugro UAE, Fugro Survey Africa, Fugro S.A.E. Egypt*** and other Fugro companies worldwide have purchased over 25 TrackLink 1500 systems for offshore oil field applications.

***Saab Seaeye*** (*www.seaeye.com*) orders a large number of TrackLink 1500 systems for ROV tracking by its worldwide customers.

Courtesy of Connolly-Pacific

***Connolly-Pacific*** used the TrackLink system in its 3-month construction project in the coastal Pacific Ocean near Newport Beach, California. Connolly-Pacific surveyed the 1.3 km long sewage pipeline and laid 53,000 tons of rocks along side the pipeline to secure its positions. The TrackLink 1500MA system provided all acoustic positioning functions such as diver tracking, DOE Phantom ROV tracking and tracking of various underwater structures along with the pipeline during the construction.

Courtesy of Odyssey Marine Exploration

***Lockheed Martin*** uses TrackLink 1500HA and inverted TrackLink 1500 systems for ROV tracking and AUV navigation.

***Odyssey Marine Explorations Inc.*** (*www.shipwreck.net*) used the TrackLink system in its discovery of the sunken remains of the S.S. Republic that could yield the richest cargo ever recovered from a shipwreck: thousands of gold coins worth as much as $180 million.

***US Navy SPAWAR*** used the TrackLink system to track unmanned underwater glider.

***SeaBotix*** of San Diego, California (*www.seabotix.com*) purchased 6 TrackLink 1500LC systems to be equipped on their LBV ROVs purchased by a US Navy EOD unit in Europe.


Courtesy of SeaBotix Inc.

Courtesy of US Navy

***Shark Marine, ECA Robotics, Sub-atlantic, Seamor Marine, Hydroacoustics, Ageotec, Outland Technology*** and other ROV manufacturers order a large number of TrackLink 1500 systems for their ROV customers worldwide.

***Onyx Special Services Inc.*** used TrackLink1500 systems to track a Phantom ROV, divers and diving bells in crew oil pipeline inspection and repairing projects in Great Lakes.

***Marathon Oil Company*** uses TrackLink 1500 systems in offshore pipeline construction projects in West Africa.

***Alaska Department of Fish and Game*** (*www.state.ak.us/adfg/adfghome.htm*) uses a TrackLink1500 system to track Phantom ROV in its survey project.

***Ocean Surveys Inc.*** of Connecticut (*www.oceansurveys.com*) uses the TrackLink1500 systems to track sidescan sonar, magnetometer, ROV and other towed instrumentation supporting numerous domestic and international marine survey projects.

Courtesy of Onyx Special Services

***Elcome Marine Services*** of India procured 5 TrackLink 1500 systems to track sidescan sonar, sub-bottom profilers and ROVs.

***MacArtney A/S*** of Denmark orders a TrackLink 1500MA system to be installed on Seaeye Marine Ltd.'s Falcon ROV.

***Survey Equipment Services*** of Houston, Texas has included five TrackLink systems in its leasing pool.


Courtesy of LeBaron Group Inc.

***CSIRO***, Australia, orders a TrackLink 1500HA system along with 4 TN1510B transponders to track towfish and ROV.

***Undersea Graphics*** of California, USA uses TrackLink 1500LC system to track its manned submersible.

***Nekton Research LLC*** of Durham, North Carolina, orders a TrackLink 1500MA system with integrated two-way acoustic communication capability. This system will be used to track the AUV while the operator performs command and control of the vehicle.

***NASA*** orders TrackLink 1500 system along with LinkQuest's 38,400 baud high speed modem for AUV tracking, navigation and communication.

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# Appendix B

# Daily Progress Reports

**Doc. No. P0031340-1-H2 Rev. 00 - 04 July 2022**

# Daily Progress Report 001

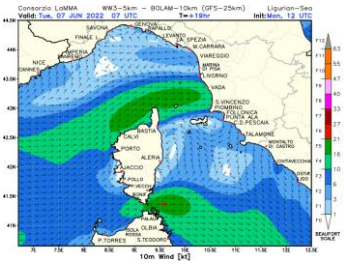
Isola Sacra Cruise Project

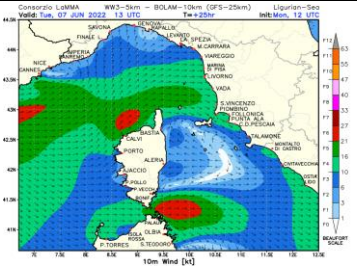
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-06 | Task | ROV/ Environmental Survey |

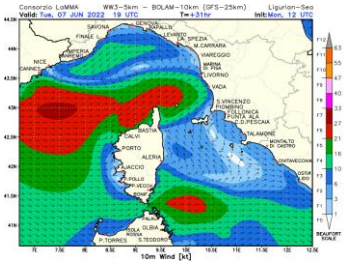
| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

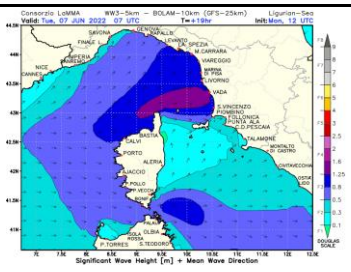
Weather Forecast (next 24 hours)

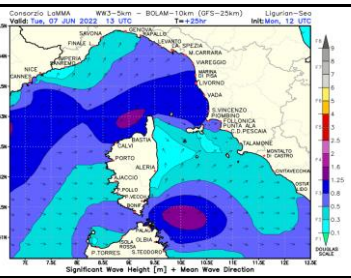
| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | W | 3 | W | 0.4 | na | 2 |

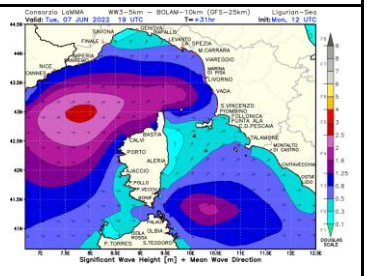



| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 10:00 | 19:00 | ROV loaded onboard, tested and interfaced with Nav | MD | 09:00 |
| 07:00 | | Weather : Wind dir. S ; Force 2 / Sea state 3 / Sig. wave H 0.9 | | |
| 13:00 | | Weather : Wind dir. NW ; Force 4 / Sea state 3 / Sig. wave H 0.9 | | |
| 19:00 | | Weather : Wind dir NW ; Force 3 / Sea state 3 / Sig. wave H 0.9 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 09:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 09:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| | | | | | | | **OVERALL PROJECT TIME** | | **09:00** |

**PROGRESS OF WORKS (BoQ)**

***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL***

| | Activity | Today (%) | Previous (%) | Total (%) | Status |
|---|---|---|---|---|---|
| Operational Information | Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Mobilisation of ROV equipment and personnel | 90 | 0 | 90 | on going |
| | Demobilisation of ROV equipment and personnel | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection | TBD | 0.00 | 0.00 | 0.00 | |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

## Work plan for next 24 hours

*Finalize video overlay, update ROV location on Nav system and commence ROV survey.*

## LIST OF SURVEY PERSONNEL

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Praia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Massimiliano Buffone | Survey Engineer | Fugro | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Paolo De Santis | RINA Representative | RINA | ITA |
| 7 | Luca Lorenzini | Survey Engineer | Fugro | ITA |
| 8 | Marco Catarinelli | Survey Engineer | Fugro | ITA |
| 9 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 10 | Antonio Aprea | Master | Fugro | ITA |

## LIST OF DELIVERED FIELD DATA AND FIELD REPORTS

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 2 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 2 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 0 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 0 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 0 |
| | 0 | 0 |

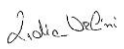
| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

Lidia Urbini (RINA Representative) and Daniele Gitto (ROV pilot) joined the Vessel today.
Further to a communication given by CR onboard, number of Niskin stations have been reduced to 23 while number of ROV dive is to be defined. Section "Production summary" has been updated accordingly.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
|  | | |

# Daily Progress Report 002

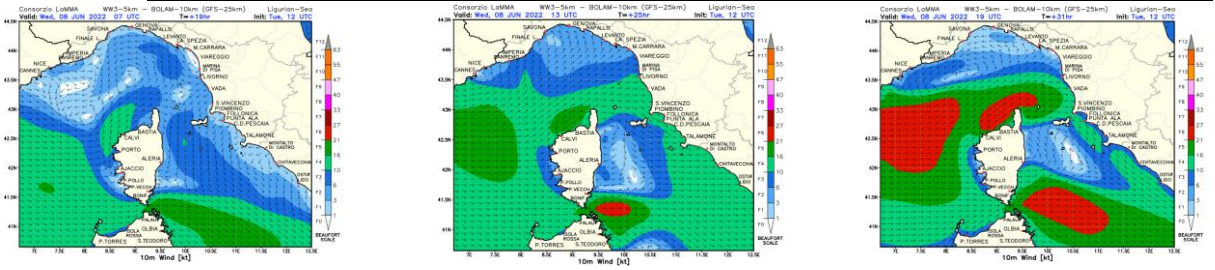
Isola Sacra Cruise Project

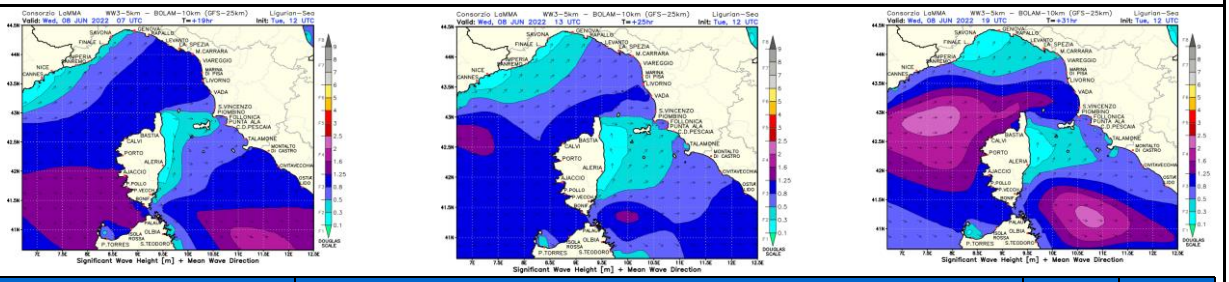
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-07 | Task | ROV/ Environmental Survey |

| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

Weather Forecast (next 24 hours)

| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | N-NW | 4 | W | 1 | na | 3 |




| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 07:05 | 10:00 | Finalize ROV settings including Video overlay and update ROV transects locations on Nav system | MD | 02:55 |
| 10:00 | 10:32 | Transit to ROV survay | SLN | 00:32 |
| 10:32 | 11:44 | Recording area of transect ENV_TR15 | WRK | 01:12 |
| 11:44 | 13:10 | During ROV recovery, the lifting rope got tangled in the pulley. Vessel move inside the area sheltered by the waterbraker to replace the pulley. | DT | 01:26 |
| 13:10 | 14:14 | Recording area of transect ENV_TR13 | WRK | 01:04 |
| 14:14 | 15:05 | Transit to next site | SLN | 00:51 |
| 15:05 | 16:48 | Recording area of transect ENV_TR12. Area partially recorded due to hugh water turbidity experienced near the breakwater | WRK | 01:43 |
| 16:48 | 17:16 | Transit to next site, farther from the coast where the visibility is expected to be better | SLN | 00:28 |
| 17:16 | 17:57 | Recording area of transect ENV_TR05 | WRK | 00:41 |
| 17:57 | 18:40 | Transit to Netter dockyard | SLN | 00:43 |
| 18:40 | 19:15 | Trasferring Archeo target to Nav Pc | WRK | 00:35 |
| 07:00 | | Weather : Wind dir. NW ; Force 2 / Sea state 2 / Sig. wave H 0.5 | | |
| 13:00 | | Weather : Wind dir. W ; Force 10 / Sea state 2 / Sig. wave H 0.5 | | |
| 19:00 | | Weather : Wind dir W ; Force 6 / Sea state 2 / Sig. wave H 0.6 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 02:55 | 02:34 | 05:15 | 00:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| Previous | 09:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 11:55 | 02:34 | 05:15 | 00:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | **OVERALL PROJECT TIME** | | **21:10** |

**PROGRESS OF WORKS (BoQ)**

***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL***

| | Activity | Today (%) | Previous (%) | Total (%) | Status |
|---|---|---|---|---|---|
| Operational Information | Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Mobilisation of ROV equipment and personnel | 10 | 90 | 100 | completed |
| | Demobilisation of ROV equipment and personnel | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 6:42 | 0.00 | 0.00 | on going |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

## Work plan for next 24 hours

*Continue ROV survey over Archeo target.*

## LIST OF SURVEY PERSONNEL

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Lidia Urbini | RINA Representative | RINA | ITA |
| 5 | Paolo De Santis | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

## LIST OF DELIVERED FIELD DATA AND FIELD REPORTS

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 4 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 4 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 0 |
| HOC | 0 | 0 |
| Risk assessment review | 1 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 1 | 1 |
| | 2 | 2 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

Retooling of ROV completed.
Environmental ROV survey started.
The area of transectd ENV_TR15 was investigated, visibility was acceptable, no SSS targets have been identified.
After transect ENV_TR15 problems of ROV handling were fixed.
The area of transect ENV_TR13 was investigated, , visibility was acceptable, no SSS targets have been identified.
The crew started the investigation of the area of transect ENV_TR12, but it was interropted due to really scarce visibility.
The area of transect ENV_TR5 was investigated, , visibility was better, a pipeline and some small plastic debries have been identified.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
| Lidia Urbini | | |

# Daily Progress Report 003

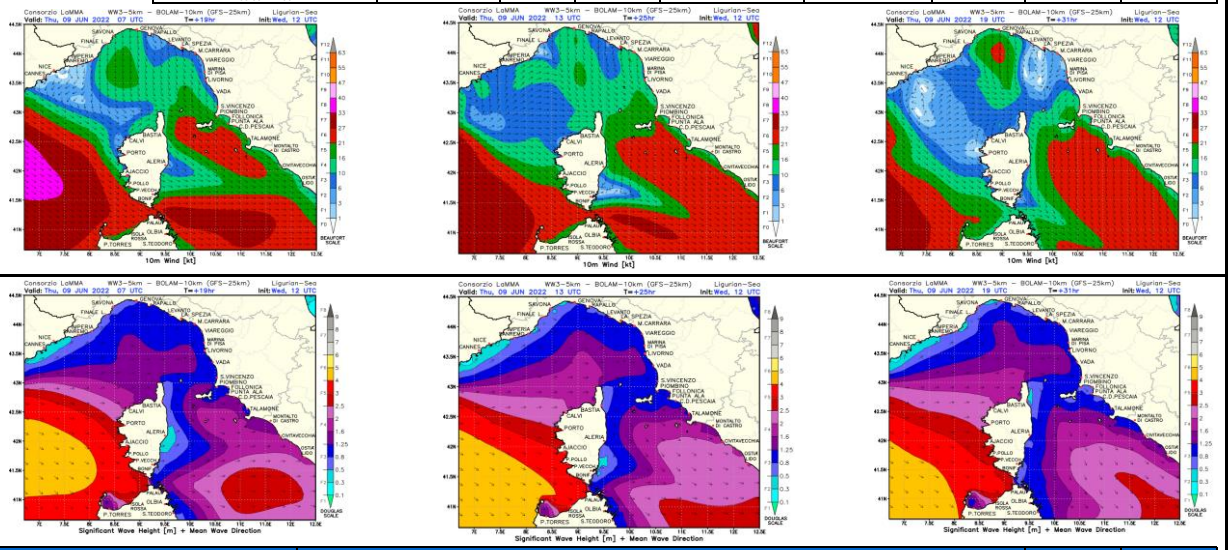
Isola Sacra Cruise Project

| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-08 | Task | ROV/ Environmental Survey |

| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

Weather Forecast (next 24 hours)

| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | N-NW | 4 | W-SW | 1.2 | na | 4 |




| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 07:00 | 07:45 | Preparing vessel for departure. Archaeologist joined the Vessel. Safety induction conducted. | WRK | 00:45 |
| 07:45 | 08:24 | Transit to working area | SLN | 00:39 |
| 08:24 | 08:48 | Recording over target ARC_46. Poor ROV visibility of seabed due to very high turbidity | WRK | 00:24 |
| 08:48 | 08:55 | Transit to next site | SLN | 00:07 |
| 08:55 | 09:07 | Recording over target ARC_16. Poor ROV visibility of seabed due to very high turbidity | WRK | 00:12 |
| 09:07 | 09:35 | Transit to a new location away from the coast with the intention to record in more clear water | SLN | 00:28 |
| 09:35 | 09:47 | Recording over target ARC_42. Poor ROV visibility of seabed due to very high turbidity | WRK | 00:12 |
| 09:47 | 10:07 | Transit to another site away from the coast, with the intention to record in more clear water | SLN | 00:20 |
| 10:07 | 10:16 | Recording over target ARC_29. Poor ROV visibility of seabed due to very high turbidity at the bottom | WRK | 00:09 |
| 10:16 | 11:00 | Weather conditions deteriorating with swell height 1,2m. No reason to remain at sea due to high water tubidity preventing recording acceptable videos. Vessel move to Netter dockyard | SLN | 00:44 |
| 11:00 | 19:00 | Vessel w.o.w alongide in Netter dockyard | SBW | 08:00 |
| 07:00 | | Weather : Wind dir. N ; Force 3 / Sea state 3 / Sig. wave H 0.9 | | |
| 13:00 | | Weather : Wind dir. W ; Force 10 / Sea state 3 / Sig. wave H 1.0 | | |
| 19:00 | | Weather : Wind dir NW ; Force 8 / Sea state 3 / Sig. wave H 0.8 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 00:00 | 02:18 | 01:42 | 08:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 02:34 | 05:15 | 00:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 11:55 | 04:52 | 06:57 | 08:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | **OVERALL PROJECT TIME** | | **33:10** |

**PROGRESS OF WORKS (BoQ)**

***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL***

| | Activity | Today (%) | Previous (%) | Total (%) | Status |
|---|---|---|---|---|---|
| Operational Information | Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Mobilisation of ROV equipment and personnel | 0 | 100 | 100 | completed |
| | Demobilisation of ROV equipment and personnel | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 1:52 | 6:42 | 8:34 | on going |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

**Work plan for next 24 hours**

*Continue ROV ops over archeo targets-Installation of USBL system.*

**LIST OF SURVEY PERSONNEL**

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Sandro Lorenzatti | Archeologist | RINA | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

**LIST OF DELIVERED FIELD DATA AND FIELD REPORTS**

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 6 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 6 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 0 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 1 | 2 |
| | 1 | 3 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

The ROV video quality is poor due to high water turbidity concentrated in the lower layers of the water column. Attempts have been made to record in different target locations both in shallow water and deeper water, keeping the ROV few centimeters from the seafloor without evident improvements.
Archaeologist joined the Vessel today

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
| Lidia Urbini | | |

# Daily Progress Report 004

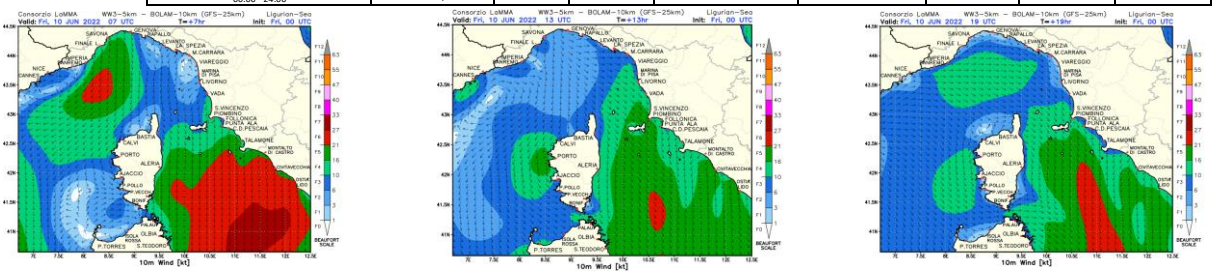
Isola Sacra Cruise Project

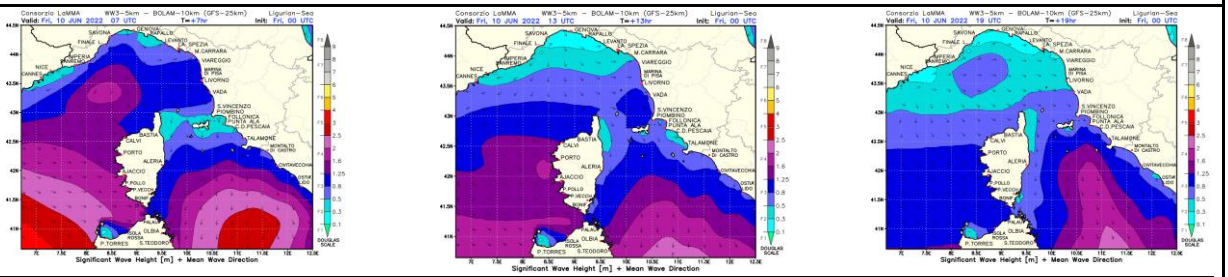
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-09 | Task | ROV/ Environmental Survey |

| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| *USBL Transceiver* | *TrackLink 1500 CL* | *mobilised* |
| *USBL Transponder* | *TrackLink 1510B* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

Weather Forecast (next 24 hours)

| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | N-NW | 4 | W-SW | 1.2 | na | 4 |




| TIME (UTC) | | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| From | To | | | |
| 07:30 | 10:30 | Weather cond. not operational. Vessel remain alongside Waiting on Weather | SBW | 03:00 |
| 10:30 | 13:00 | USBL system Installation | SBW | 02:30 |
| 13:00 | 14:20 | Waiting on Weather | SBW | 01:20 |
| 14:20 | 14:33 | Vessel shift from Netter dockyard to the jetty along Tiber river | SBW | 00:13 |
| 14:33 | 15:20 | Vessel along side, ROV deployed in the water for USBL functionality test and position verification | SBW | 00:47 |
| 15:20 | 15:30 | ROV recovered onboard | SBW | 00:10 |
| 15:30 | 19:30 | Vessel move to Netter dockyard. Waiting on Weather | SBW | 04:00 |
| 07:00 | | Weather : Wind dir. NW ; Force 4 / Sea state 3 / Sig. wave H 1.2 | | |
| 13:00 | | Weather : Wind dir. NW ; Force 6 / Sea state 4 / Sig. wave H 1.2 | | |
| 19:00 | | Weather : Wind dir N ; Force 6 / Sea state 4 / Sig. wave H 1.2 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 00:00 | 00:00 | 00:00 | 12:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 04:52 | 06:57 | 08:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 11:55 | 04:52 | 06:57 | 20:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | **OVERALL PROJECT TIME** | | **45:10** |

**PROGRESS OF WORKS (BoQ)**

***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL***

| | Activity | Today (%) | Previous (%) | Total (%) | Status |
|---|---|---|---|---|---|
| Operational Information | Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Mobilisation of ROV equipment and personnel | 0 | 100 | 100 | completed |
| | Demobilisation of ROV equipment and personnel | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 0:00 | 8:34 | 8:34 | on going |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

## Work plan for next 24 hours

*Assess weather conditions and resume to ROV survey operations*

## LIST OF SURVEY PERSONNEL

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Sandro Lorenzatti | Archeologist | RINA | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

## LIST OF DELIVERED FIELD DATA AND FIELD REPORTS

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 8 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 8 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 0 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 2 |
| | 0 | 3 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

USBL system was installed onboard on the over the side pole.
Static positioning verification was intially carried out with the vessel alongside Netter dockyard by placing the beacon, at a known depth, respectively at the center of Vessel Port and Starboard, and at the center stern and bow.
A further verification was carried out with the beacon mounted on the ROV in a 3,5m WD. Good position and stable signal was received from transponder up to 35m distance from the Vessel.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
| Lidia Urbini | | |

# Daily Progress Report 005

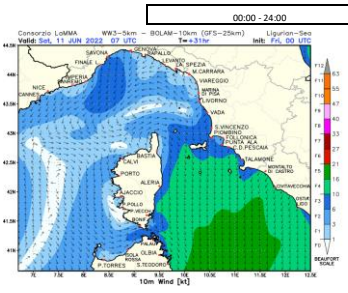
Isola Sacra Cruise Project

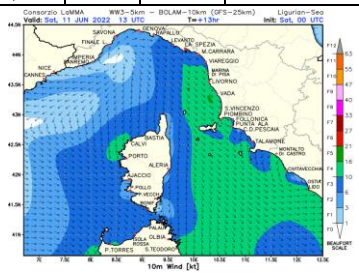
| | | | |
|---|---|---|---|
| Company | *Royal Caribbean Group* | Vessel name | *MB Vega Uno* |
| Company Project Ref | *Task Order 13* | Activity | *Marine Survey (WP3)* |
| Project number | *P0031340-1* | Area | *Tirrenian Sea - Isola Sacra ( Fiumicino )* |
| Date: (yyyy-mm-dd) | *2022-06-10* | Task | *ROV/ Environmental Survey* |

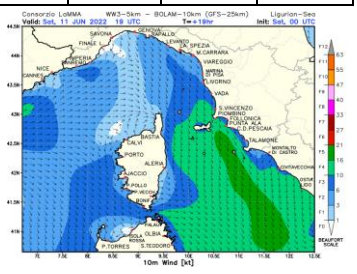
| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| *USBL Transceiver* | *TrackLink 1500 CL* | *mobilised* |
| *USBL Transponder* | *TrackLink 1510B* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

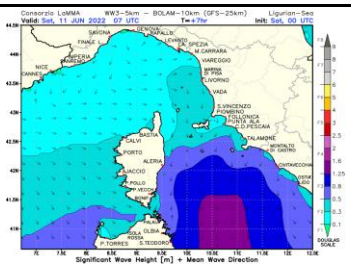
Weather Forecast (next 24 hours)

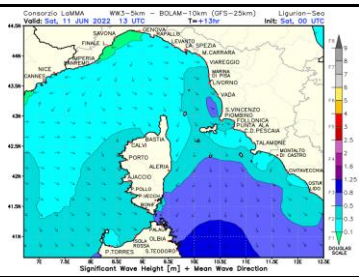
| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | N-W | 3 | NW-W | 0.7 | na | 3 |

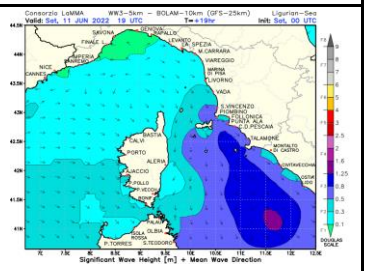



| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 07:00 | 19:00 | Weather conditions not operational. Vessel alongside Waiting on Weather | SBW | 12:00 |
| 07:00 | | Weather : Wind dir. N ; Force 6 / Sea state 4 / Sig. wave H 1.5 | | |
| 13:00 | | Weather : Wind dir. N ; Force 7 / Sea state 4 / Sig. wave H 1.2 | | |
| 19:00 | | Weather : Wind dir N ; Force 6 / Sea state 4 / Sig. wave H 1.2 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 00:00 | 00:00 | 00:00 | 12:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 04:52 | 06:57 | 20:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 11:55 | 04:52 | 06:57 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | | **OVERALL PROJECT TIME** | **57:10** |

**PROGRESS OF WORKS (BoQ)**

***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL***

| | Activity | Today (%) | Previous (%) | Total (%) | Status |
|---|---|---|---|---|---|
| Operational Information | Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Mobilisation of ROV equipment and personnel | 0 | 100 | 100 | completed |
| | Demobilisation of ROV equipment and personnel | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 0:00 | 8:34 | 8:34 | on going |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

**Work plan for next 24 hours**

*Assess weather conditions and resume to ROV survey operations*

**LIST OF SURVEY PERSONNEL**

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Sandro Lorenzatti | Archeologist | RINA | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

**LIST OF DELIVERED FIELD DATA AND FIELD REPORTS**

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 10 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 10 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 1 | 1 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 2 |
| | 1 | 4 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
|  | | |

# Daily Progress Report 006

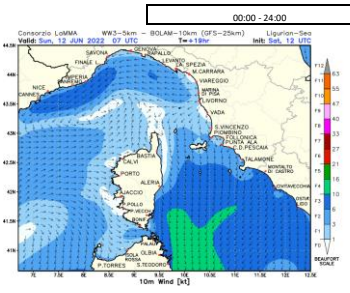
Isola Sacra Cruise Project

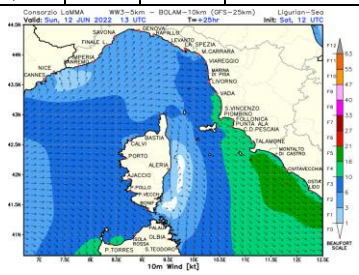
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-11 | Task | ROV/ Environmental Survey |

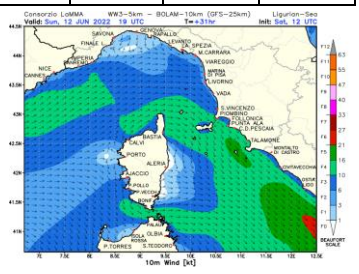
| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| *USBL Transceiver* | *TrackLink 1500 CL* | *mobilised* |
| *USBL Transponder* | *TrackLink 1510B* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

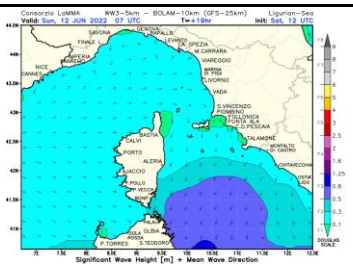
Weather Forecast (next 24 hours)

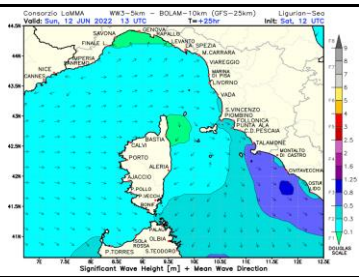
| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | NW-NE | 3 | NW-W | 0.6 | na | 3 |

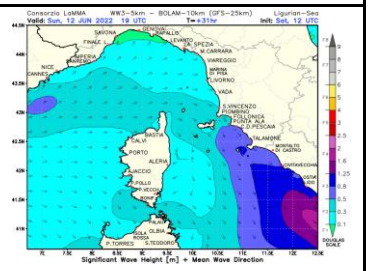



| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 07:00 | 07:30 | Preparing vessel for departure | WRK | 00:30 |
| 07:30 | 08:15 | Transit to site | SLN | 00:45 |
| 08:15 | 08:28 | Vessel in position. Deploying ROV in the water | WRK | 00:13 |
| 08:28 | 09:07 | Recording ROV video over area ENV_TR01 | WRK | 00:39 |
| 09:07 | 09:23 | Transit to next site | SLN | 00:16 |
| 09:23 | 09:47 | Recording ROV video over area ENV_ARCHEO TR02 | WRK | 00:24 |
| 09:47 | 10:09 | Transit to next site | SLN | 00:22 |
| 10:09 | 11:43 | Recording ROV video over area ENV_ARCHEO TR03 | WRK | 01:34 |
| 11:43 | 11:55 | Transit to next site | SLN | 00:12 |
| 11:55 | 12:30 | Recording ROV video over area ENV_ARCHEO TR04 | WRK | 00:35 |
| 12:30 | 13:27 | Transit to next site | SLN | 00:57 |
| 13:27 | 14:11 | Recording ROV video over area ENV_ARCHEO TR06 | WRK | 00:44 |
| 14:11 | 14:25 | Transit to next site | SLN | 00:14 |
| 14:25 | 14:41 | Recording ROV video over area of target SSS182 | WRK | 00:16 |
| 14:41 | 14:57 | Transit to next site | SLN | 00:16 |
| 14:57 | 15:58 | Recording ROV video over area ENV_ARCHEO TR07 | WRK | 01:01 |
| 15:58 | 16:21 | Transit to next site | SLN | 00:23 |
| 16:21 | 16:48 | Vessel can't hold the position due to dragging anchor. ROV Recovered onboard and shift the vessel to a close position | WRK | 00:27 |
| 16:48 | 17:20 | Recording ROV video over area ENV_ARCHEO TR09 | WRK | 00:32 |
| 17:20 | 17:43 | Transit to next site, more sheltered from the wind | SLN | 00:23 |
| 17:43 | 17:56 | Recording ROV video over area ENV_ARCHEOTR17. Recording not completed due to poor visibility and worsening of weather conditions | WRK | 00:13 |
| 17:56 | 18:40 | ROV onboard and transit to Netter dockyard | SLN | 00:44 |
| 18:40 | 19:00 | Data backup | WRK | 00:20 |
| 07:00 | | Weather : Wind dir. N ; Force 2 / Sea state 2 / Sig. wave H 0.5 | | |
| 13:00 | | Weather : Wind dir. N ; Force 3 / Sea state 2 / Sig. wave H 0.5 | | |
| 19:00 | | Weather : Wind dir W ; Force 3 / Sea state 3 / Sig. wave H 0.8 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 00:00 | 04:32 | 07:28 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 04:52 | 06:57 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 11:55 | 09:24 | 14:25 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | **OVERALL PROJECT TIME** | | **69:10** |

**PROGRESS OF WORKS (BoQ)**

| *SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL* | | | | | |
|---|---|---|---|---|---|
| | **Activity** | **Today (%)** | **Previous (%)** | **Total (%)** | **Status** |
| **Operational Information** | **Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel** | 0 | 0 | 0 | |
| | **Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel** | 0 | 0 | 0 | |
| | **Mobilisation of ROV equipment and personnel** | 0 | 100 | 100 | completed |
| | **Demobilisation of ROV equipment and personnel** | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 9:41 | 8:34 | 18:15 | on going |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

**Work plan for next 24 hours**

*Continue ROV survey operations*

**LIST OF SURVEY PERSONNEL**

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Sandro Lorenzatti | Archeologist | RINA | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

**LIST OF DELIVERED FIELD DATA AND FIELD REPORTS**

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 12 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 12 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 1 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 2 |
| | 0 | 4 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

ROV survey restarted.
The area of ENV_TR01 was investigated, visibility was ok.
The area of ENV_ARCHEO TR02 was investigated, visibility was ok, some debries, corresponding to SSS targets, were identified.
The area of ENV_ARCHEO TR03 was investigated, visibility was ok, some debries, corresponding to SSS targets, were identified. The video was recorded in two steps.
The area of ENV_ARCHEO TR04 was investigated, visibility was ok, some debries, corresponding to SSS targets, were identified.
The area of ENV_ARCHEO TR06 was investigated, visibility was ok, a pipeline and some debries, corresponding to SSS targets, were identified.
The area of target SSS182 was investigated, visibility was ok, some debries, corresponding to SSS targets, were identified.
The area of ENV_ARCHEO TR07 was investigated, visibility worsen but was still acceptable, some debries, corresponding to SSS targets, were identified.
The worsening of weather conditions caused problems in vessel positioning.
The area of ENV_ARCHEO TR09 was investigated, visibility worsen but was still acceptable, some debries, corresponding to SSS targets, were identified.
Vessel moved in more sheltered waters.
A tentative to investigate area of ENV_ARCHEO TR17 was done, but it was interrupted due to poor visibility and worsening of weather conditions.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
| Lidia Urbini | | |

# Daily Progress Report 007

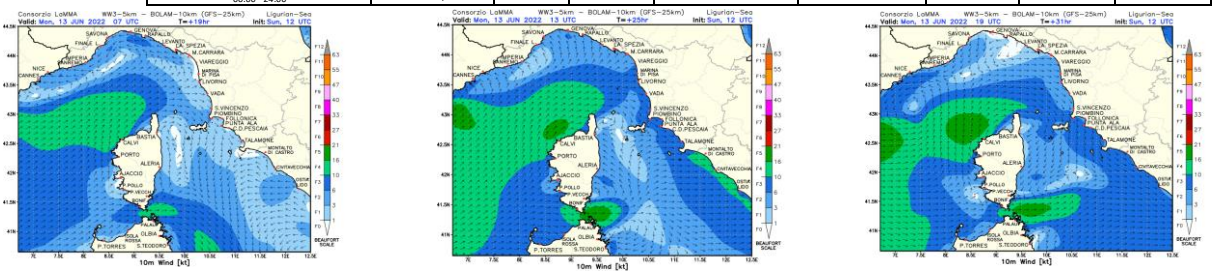
Isola Sacra Cruise Project

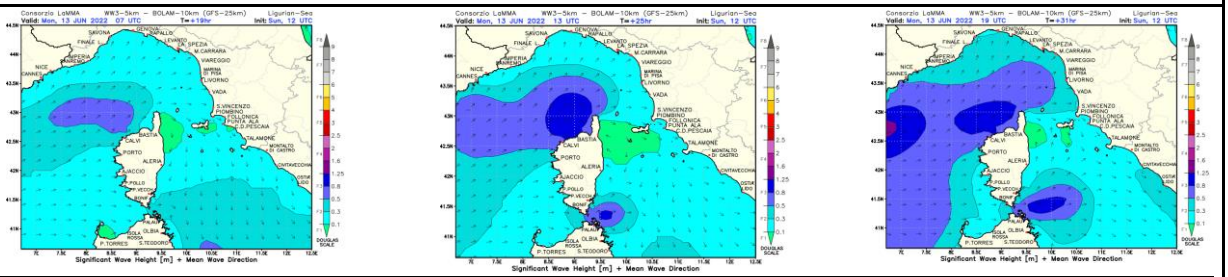
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-12 | Task | ROV/ Environmental Survey |

| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| *USBL Transceiver* | *TrackLink 1500 CL* | *mobilised* |
| *USBL Transponder* | *TrackLink 1510B* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

Weather Forecast (next 24 hours)

| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | NE-W | 2 | W | 0.2 | na | 2 |




| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 07:00 | 07:20 | Preparing vessel for departure | WRK | 00:20 |
| 07:20 | 08:03 | Transit to site | SLN | 00:43 |
| 08:03 | 08:11 | Vessel in position. Deploying ROV in the water | WRK | 00:08 |
| 08:11 | 12:45 | Recording ROV video over area ENV_ARCHEO TR17. The video was entirely repeated as section recorded on 11 June was affected by poor visibility. | WRK | 04:34 |
| 12:45 | 13:27 | Transit to next site | SLN | 00:42 |
| 13:27 | 16:22 | Recording ROV video over area ENV_ARCHEO TR16 | WRK | 02:55 |
| 16:22 | 16:48 | Transit to next site | SLN | 00:26 |
| 16:48 | 17:17 | Recording ROV video over area ENV_TR10 | WRK | 00:29 |
| 17:17 | 17:36 | Transit to next site | SLN | 00:19 |
| 17:36 | 17:46 | Recording ROV video over area of target SSS_232 | WRK | 00:10 |
| 17:46 | 17:59 | Transit to next site | SLN | 00:13 |
| 17:59 | 18:05 | Recording ROV video over area of target SSS_494 | WRK | 00:06 |
| 18:05 | 18:45 | Recover ROV onboard and move to Netter dockyard | SLN | 00:40 |
| 18:45 | 19:00 | Data back up | WRK | 00:15 |
| 07:00 | | Weather : Wind dir. NE ; Force 2 / Sea state 2 / Sig. wave H 0.5 | | |
| 13:00 | | Weather : Wind dir. NW ; Force 4 / Sea state 2 / Sig. wave H 0.5 | | |
| 19:00 | | Weather : Wind dir NW ; Force 3 / Sea state 2 / Sig. wave H 0.6 | | |

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 00:00 | 03:03 | 08:57 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 09:24 | 14:25 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 11:55 | 12:27 | 23:22 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | | **OVERALL PROJECT TIME** | **81:10** |

**PROGRESS OF WORKS (BoQ)**

***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL***

| | Activity | Today (%) | Previous (%) | Total (%) | Status |
|---|---|---|---|---|---|
| Operational Information | Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel | 0 | 0 | 0 | |
| | Mobilisation of ROV equipment and personnel | 0 | 100 | 100 | completed |
| | Demobilisation of ROV equipment and personnel | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 10:02 | 18:15 | 28:17 | on going |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

## Work plan for next 24 hours

*Continue ROV survey operations*

## LIST OF SURVEY PERSONNEL

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Sandro Lorenzatti | Archeologist | RINA | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

## LIST OF DELIVERED FIELD DATA AND FIELD REPORTS

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 14 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 14 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 1 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 2 |
| | 0 | 4 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

The area of ENV_ARCHEO TR17 was investigated, visibility was acceptable, some debries, corresponding to SSS targets, were identified.
The area of ENV_ARCHEO TR16 was investigated, visibility was good at the beginning and eorsen in some areas, but was still acceptable. Some debries, corresponding to SSS targets, were identified. The recording of the area was divided in six different ROV videos.
The area of ENV_10 was investigated, visibility was acceptable.
The area of target SSS232 was investigated, visibility was ok, no target was identified.
The area of target SSS494 was investigated, visibility was ok, no target was identified.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
| Lidia Urbini | | |

# Daily Progress Report 008

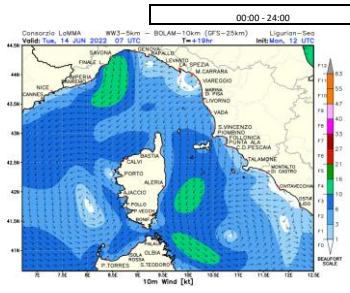
Isola Sacra Cruise Project

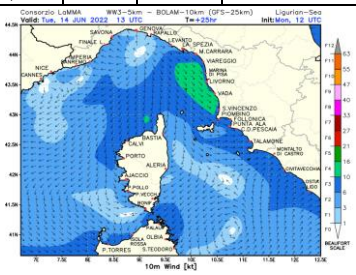
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-13 | Task | ROV/ Environmental Survey |

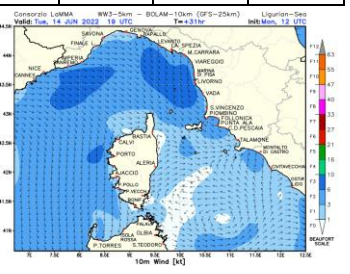
| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *mobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| *USBL Transceiver* | *TrackLink 1500 CL* | *mobilised* |
| *USBL Transponder* | *TrackLink 1510B* | *mobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle* | *demobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *demobilised* |

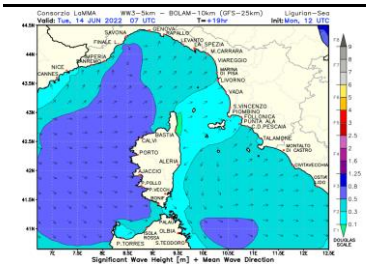
Weather Forecast (next 24 hours)

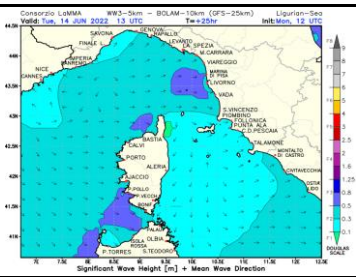
| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | SE-SW | 2 | W | 0.3 | na | 2 |

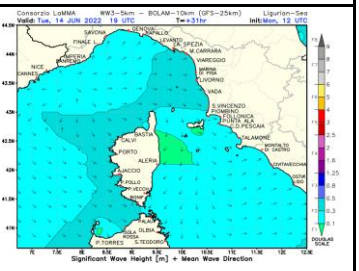



| TIME (UTC) From | TIME (UTC) To | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| 07:00 | 07:20 | Preparing vessel for departure | WRK | 00:20 |
| 07:20 | 07:54 | Transit to site | SLN | 00:34 |
| 07:54 | 08:01 | Vessel in position. Deploying ROV in the water | WRK | 00:07 |
| 08:01 | 08:22 | Recording ROV video over area ENV_TR13REP. The video was entirely repeated as section recorded on 7 June was performed without the USBL system | WRK | 00:21 |
| 08:22 | 08:46 | Transit to next area | SLN | 00:24 |
| 08:46 | 10:00 | Recording ROV video over area ENV_ARCHEO TR11 | WRK | 01:14 |
| 10:00 | 10:17 | Transit to next area | SLN | 00:17 |
| 10:17 | 11:17 | Recording ROV video over area ENV_ARCHEO TR08 | WRK | 01:00 |
| 11:17 | 11:36 | Transit to next area | SLN | 00:19 |
| 11:36 | 12:31 | Recording ROV video over area ENV_ARCHEO TR14 | WRK | 00:55 |
| 12:31 | 13:30 | Transit to next area | SLN | 00:59 |
| 13:30 | 13:59 | Recording ROV video over area ENV_TR05REP. The video was entirely repeated as section recorded on 7 June was performed without the USBL system | WRK | 00:29 |
| 13:59 | 14:32 | Transit to next area | SLN | 00:33 |
| 14:32 | 15:46 | Recording ROV video over area ENV_TR12REP. The video was entirely repeated as section recorded on 7 June was performed without the USBL system | WRK | 01:14 |
| 15:46 | 16:06 | Transit to next area | SLN | 00:20 |
| 16:06 | 16:27 | Recording ROV video over area ENV_TR15REP. The video was entirely repeated as section recorded on 7 June was performed without the USBL system | WRK | 00:21 |
| 16:27 | 17:37 | Transit to next area | SLN | 01:10 |
| 17:37 | 17:44 | Recording ROV video over area of SSS target SSS811 | WRK | 00:07 |
| 17:44 | 17:47 | Transit to next area | SLN | 00:03 |
| 17:47 | 17:53 | Recording ROV video over area of SSS target SSS808 | WRK | 00:06 |
| 17:53 | 18:05 | ROV on board vessel move to Netter dockyard | SLN | 00:12 |
| 18:05 | 19:00 | Data backup | WRK | 00:55 |
| 07:00 | | Weather : Wind dir. SW ; Force 1 / Sea state 2 / Sig. wave H 0.4 | | |
| 13:00 | | Weather : Wind dir. SW ; Force 1 / Sea state 2 / Sig. wave H 0.4 | | |
| 19:00 | | Weather : Wind dir SW ; Force 2 / Sea state 2 / Sig. wave H 0.4 | | |
| | | | | |

Remark: *Activities have to be described separately and in correct sequence. All works are without defects and in accordance with PEP and project HSE documentation.*

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 00:00 | 04:51 | 07:09 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 12:27 | 23:22 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Total overview** | 11:55 | 17:18 | 30:31 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | | **OVERALL PROJECT TIME** | **93:10** |

| **PROGRESS OF WORKS (BoQ)** | | | | | |
|---|---|---|---|---|---|
| ***SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL*** | | | | | |
| | **Activity** | **Today (%)** | **Previous (%)** | **Total (%)** | **Status** |
| **Operational Information** | **Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel** | 0 | 0 | 0 | |
| | **Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel** | 0 | 0 | 0 | |
| | **Mobilisation of ROV equipment and personnel** | 0 | 100 | 100 | completed |
| | **Demobilisation of ROV equipment and personnel** | 0 | 0 | 0 | |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 9:59 | 28:17 | 38:16 | completed |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 0.00 | 0.00 | 0.00 | |

**Work plan for next 24 hours**

*Demob ROV and mobilize equipment for environmental survey*

**LIST OF SURVEY PERSONNEL**

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Sandro Lorenzatti | Archeologist | RINA | ITA |
| 5 | Lidia Urbini | RINA Representative | RINA | ITA |
| 6 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 7 | Antonio Aprea | Master | Fugro | ITA |

**LIST OF DELIVERED FIELD DATA AND FIELD REPORTS**

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 16 |
| Safety Toolbox | 0 | 0 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 2 | 16 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 1 |
| HOC | 0 | 0 |
| Risk assessment review | 0 | 1 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 2 |
| | 0 | 4 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

***CONTRACTOR Comments***

The area of: ENV_TR13, ENV_ARCHEO TR11, ENV_ARCHEO TR08, ENV_ARCHEO TR14, ENV_TR05 , ENV_TR12, ENV_TR15, SSS811, SSS808 were investigated.
Some debries, corresponding to SSS targets, were identified.
ROV survey is completed.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
| Lidia Urbini | | |

# Daily Progress Report 009

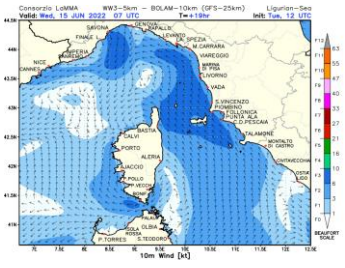
Isola Sacra Cruise Project

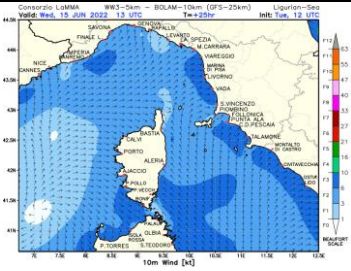
| | | | |
|---|---|---|---|
| Company | Royal Caribbean Group | Vessel name | MB Vega Uno |
| Company Project Ref | Task Order 13 | Activity | Marine Survey (WP3) |
| Project number | P0031340-1 | Area | Tirrenian Sea - Isola Sacra ( Fiumicino ) |
| Date: (yyyy-mm-dd) | 2022-06-14 | Task | ROV/ Environmental Survey |

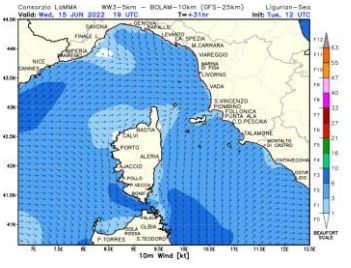
| Equipment | Type | Remarks |
|---|---|---|
| ***ROV Survey*** | | |
| *ROV dive* | *Pollux III* | *demobilised* |
| *Cable Counting* | *T count* | *mobilised* |
| *Gyro* | *Meridian gyrocompass* | *mobilised* |
| *Positioning System* | *Starfix Positioning and Navigation system x2* | *mobilised* |
| *USBL Transceiver* | *TrackLink 1500 CL* | *demobilised* |
| *USBL Transponder* | *TrackLink 1510B* | *demobilised* |
| ***Environmental Survey*** | | |
| *Water sampling* | *Niskin bottle 10 L* | *mobilised* |
| *CTD probe* | *Seabird SBE 19plus* | *mobilised* |
| *Current meter* | *AANDREAA RCM 9LW* | *mobilised* |
| *Secchi disk* | *Secchi disk* | *mobilised* |
| *Sediment sampling* | *Van Veen grab sampler* | *mobilised* |

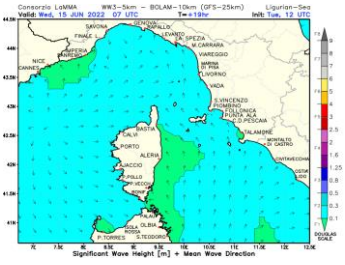
Weather Forecast (next 24 hours)

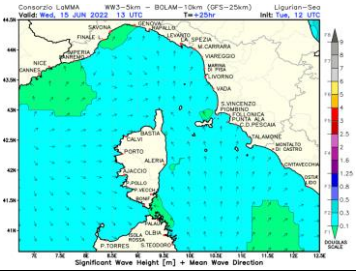
| | Weather | Current | Wind Dir. | Wind | Wave Dir. | Sig. Wave H | Wave Period | Sea State |
|---|---|---|---|---|---|---|---|---|
| | [Sun/Rain/...] | (knots) | [N, NE, E, ...] | [Beaufort] | [N, NE, E, ...] | [m] | [s] | [0 to 9] |
| 00:00 - 24:00 | Sunny | na | SE-SW | 2 | W | 0.2 | na | 2 |

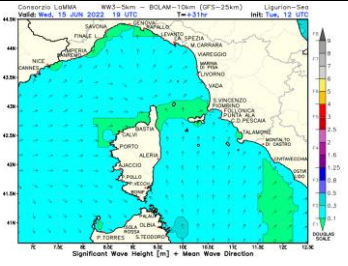



| TIME (UTC) | | ACTIVITY DESCRIPTION | CODE | HOURS |
|---|---|---|---|---|
| From | To | | | |
| 07:00 | 09:00 | Demobilization of ROV and USBL equipment | MD | 02:00 |
| 09:00 | 14:20 | Mobilization of environmental sampling equipment including Niskin bottles, CTD probe, Secchi disk, Current meter, Van Veen grab sampler and ancillaries | MD | 05:20 |
| 14:20 | 14:50 | Transit to working area | SLN | 00:30 |
| 14:50 | 15:05 | Current meter deployed at pos. 2288935.511m E 4626933.222m N WD 5.2m | WRK | 00:15 |
| 15:05 | 15:15 | Transit to first water sampling location | SLN | 00:10 |
| 15:15 | 15:34 | Perform CTD + Water samplings at station A12 | WRK | 00:19 |
| 15:34 | 15:42 | Transit to next sampling location | SLN | 00:08 |
| 15:42 | 15:53 | Perform CTD + Water samplings at station A15 | WRK | 00:11 |
| 15:53 | 15:59 | Transit to next sampling location | SLN | 00:06 |
| 15:59 | 16:12 | Perform CTD + Water samplings at station A18 | WRK | 00:13 |
| 16:12 | 16:20 | Transit to next sampling location | SLN | 00:08 |
| 16:20 | 16:30 | Perform CTD + Water samplings at station A21 | WRK | 00:10 |
| 16:30 | 16:52 | Transit to next sampling location | SLN | 00:22 |
| 16:52 | 17:03 | Perform CTD + Water samplings at station A01 | WRK | 00:11 |
| 17:03 | 17:09 | Transit to next sampling location | SLN | 00:06 |
| 17:09 | 17:30 | Perform CTD + Water samplings at station A02 | WRK | 00:21 |
| 17:30 | 17:38 | Transit to next sampling location | SLN | 00:08 |
| 17:38 | 18:03 | Perform CTD + Water samplings at station A03 | WRK | 00:25 |
| 18:03 | 18:10 | Transit to next sampling location | SLN | 00:07 |
| 18:10 | 18:16 | Perform CTD + Water samplings at station A06 | WRK | 00:06 |
| 18:16 | 18:31 | Recover Current meter | WRK | 00:15 |
| 18:31 | 19:00 | Vessel in transit to Netter dockyard | SLN | 00:29 |
| 07:00 | | Weather : Wind dir. SW ; Force 1 / Sea state 2 / Sig. wave H 0.2 | | |
| 13:00 | | Weather : Wind dir. SW ; Force 1 / Sea state 2 / Sig. wave H 0.2 | | |
| 19:00 | | Weather : Wind dir SE ; Force 1 / Sea state 2 / Sig. wave H 0.2 | | |
| | | | | |

Remark: *Activities have to be described separately and in correct sequence. All works are without defects and in accordance with PEP and project HSE documentation.*

| Activity | Mob/ Demob | Sailing /Transit | WORK | Standby Weather | Standby beyond CONTRACTOR control | Equipment / Vessel downtime | Crew changes | Other | Additional works/ Variation |
|---|---|---|---|---|---|---|---|---|---|
| CODE | MD | SLN | WRK | SBW | SBB | DT | CC | OTH | AW |
| Today | 07:20 | 02:14 | 02:26 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 |
| Previous | 11:55 | 17:18 | 30:31 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| **Total overview** | 19:15 | 19:32 | 32:57 | 32:00 | 00:00 | 01:26 | 00:00 | 00:00 | 00:00 |
| | | | | | | | **OVERALL PROJECT TIME** | | **105:10** |

| PROGRESS OF WORKS (BoQ) | | | | | |
|---|---|---|---|---|---|
| *SECTION 2 - SURVEY VESSELS, EQUIPMENT AND PERSONNEL* | | | | | |
| | **Activity** | **Today (%)** | **Previous (%)** | **Total (%)** | **Status** |
| **Operational Information** | **Mobilisation of Niskin bottle/ Van Veen grab sampler and personnel** | 100 | 0 | 100 | completed |
| | **Demobilisation of Niskin bottle/ Van Veen grab sampler and personnel** | 0 | 0 | 0 | |
| | **Mobilisation of ROV equipment and personnel** | 0 | 100 | 100 | completed |
| | **Demobilisation of ROV equipment and personnel** | 100 | 0 | 100 | completed |

| SECTION 3 - MARINE SURVEY | | | | | | |
|---|---|---|---|---|---|---|
| | Activity | Planned | Today | Previous | Total | Status |
| ROV Survey | Isola Sacra Visual Inspection (operative hours) | 60.00 | 0:00 | 38:16 | 38:16 | completed |
| Environmental Survey | Van Veen grab | 29 | 0.00 | 0.00 | 0.00 | |
| | Niskin Bottle | 23 | 8.00 | 0.00 | 8.00 | on going |

**Work plan for next 24 hours**

*Complete water samplings and commence sediment samplings*

**LIST OF SURVEY PERSONNEL**

| No. | Name | Role | Company | Nationality |
|---|---|---|---|---|
| 1 | Raffaele Fantini | Party Chief | Fugro | ITA |
| 2 | Davide Proia | Surveyor | Fugro | ITA |
| 3 | Daniele Gitto | ROV Engineer | Fugro | ITA |
| 4 | Lidia Urbini | RINA Representative | RINA | ITA |
| 5 | Marco Catarinelli | Survey Engineer | Fugro | ITA |
| 6 | David Bigazzi | Biologist | RINA | ITA |
| 7 | Simone Di Giacomo | Biologist | RINA | ITA |
| 8 | Francesco Disilvio | Chief Officer | Fugro | ITA |
| 9 | Antonio Aprea | Master | Fugro | ITA |

**LIST OF DELIVERED FIELD DATA AND FIELD REPORTS**

| Date | Title | Type |
|---|---|---|
| | | |

| SHE event: | Today | Project |
|---|---|---|
| Daily Toolbox | 2 | 18 |
| Safety Toolbox | 1 | 1 |
| Project Meeting | 0 | 0 |
| Incidents/Accidents | 0 | 0 |
| Hazard Notification | 0 | 0 |
| | 3 | 19 |

| SHE Event: | Today | Project |
|---|---|---|
| Safety Drill | 0 | 1 |
| HOC | 0 | 0 |
| Risk assessment review | 1 | 2 |
| Near Miss | 0 | 0 |
| Safety Induction | 0 | 2 |
| | 1 | 5 |

| QA Event: | Today | Project |
|---|---|---|
| Non Conformities | 0 | 0 |
| Managment of Change (MOC) | 0 | 0 |
| | 0 | 0 |

| Deliverables Events: | Today | Project |
|---|---|---|
| Calibration Forms | 0 | 0 |
| Field report | 0 | 0 |
| | 0 | 0 |

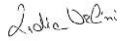
***CONTRACTOR Comments***

Demobilization of ROV and USBL equipment.
David Bigazzi and Simone Di Giacomo (Biologists) joined the vessel today.

**Environmental survey:**
Mobilization of environmental sampling equipment completed.
Beginning of water samplings.
Water samplings performed in stations: A12, A15, A18, A21, A01, A02, A03, A06.

**UXO survey:**
Mobilization of vessel, personel and equipment for uxo (Unexploded ordnance) investigation completed.

***COMPANY Representative Comments***

| Site Manager | Site Manager | Client Representative |
|---|---|---|
| L. Urbini | | |
|  | | |

**RINA Consulting S.p.A.** | Società soggetta a direzione e coordinamento amministrativo e finanziario del socio unico RINA S.p.A.
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