Architectural, Archaeological, Historical & Cultural Heritage and Related Material Assets

As per ERA requirements for PA/04448/22

Technical Report

AIS ARCHAEOLOGY

Architectural, Archaeological, Historical & Cultural Heritage and Related Material Assets

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1 Introduction

This report describes the archaeological and cultural heritage impact assessment arising from the construction and operation of the proposed development (PA/04448/22). The development application proposes the "*construction of the second cable link inter-connector project. The proposal includes trenching, laying, cable jointing and installation between the Enemalta 132kV Maghtab Terminal Station and the near shore approach, construction of underground joint bays, a trench-less transition from onshore to offshore and the laying and protection of the submarine cable up to the median line between Maghtab, Naxxar and Ragusa, Sicily*".

The project, hereinafter referred to as the "Scheme", aims to secure the electrical supply to the Maltese Islands.

This technical study identifies the Architectural, Archaeological, Historical & Cultural Heritage and related Material Assets, and assesses the impacts caused in relation to the Environmental Impact Assessment (EIA) for the proposed interconnector cable between Malta and Sicily. The terrestrial aspect of this study falls in the Magħtab area within the locality of Naxxar.

This report comprises an archaeological baseline study of the proposed Scheme, based on an archaeological assessment of reviewed records held by national inventories and secondary sources relating to the historic environment of the area. This archaeological baseline also includes an assessment of the value and sensitivity of any identified archaeological assets within the Scheme and additional 100 m wide buffer distance, supported by a field survey of the proposed construction footprint and surrounding area (Section 5.5). The conclusions and findings of this report may be used to assist and inform the planning process for the proposed project, any eventual monitoring programme or further development.

1.1 The Scheme

The proposed cable shall connect Malta to the TERNA 220kV substation located in Sicily. The primary aim of the project is to transmit electricity via a second electrical interconnector (IC2) between Maghtab, Naxxar (Malta) and Contrada Cimillà, Ragusa (Sicily).

The length of the submarine cable is estimated to be 99.6km, while the onshore cable is estimated to be around 1.8km in Malta and 20.6km in Sicily. The transmission voltage to Malta shall be at 220kV with transformation to match the local 132kV network in Malta. To maximize the project's benefits, the proposed interconnector shall operate in parallel with the existing link.

Malta is already connected to the European electricity grid through a submarine cable interconnection (IC1) to Sicily since 2015. Once the new project is implemented, Malta will be better equipped to address the ever-increasing electrical demand attributed primarily to economic growth and increasing population. Furthermore, the project will also be an enabler of further renewable energy generation as it can allow for Renewable Energy Sources (RES) intermittency. The need for such a project also stems from the European Green Deal and other policy documents which oblige member states to prioritise carbon emission neutrality by 2050. In fact, the proposed cable is expected to reduce the dependency on fossil fuel power generation at Delimara Power Station and increase the security of supply with the potential for increased energy input from renewables.

In order to minimise the environmental impact of the project, the Applicant is proposing to make use of the existing transmission station just outside the ECOHIVE complex, in Maghtab, Naxxar. On shore, the cable shall be installed in underground trenches passing through or in close proximity to the ECOHIVE complex which is operated by WasteServ Malta. The onshore and nearshore approaches will be connected via trenchless drilling techniques passing underneath the Coast Road, which forms part of the Ten-T network. The offshore cable shall be buried beneath the seafloor to a nominal depth of circa 1.5m on the most optimal route. The cable shall also be protected by means of rock protection/placement in certain areas which do not facilitate cable burying.

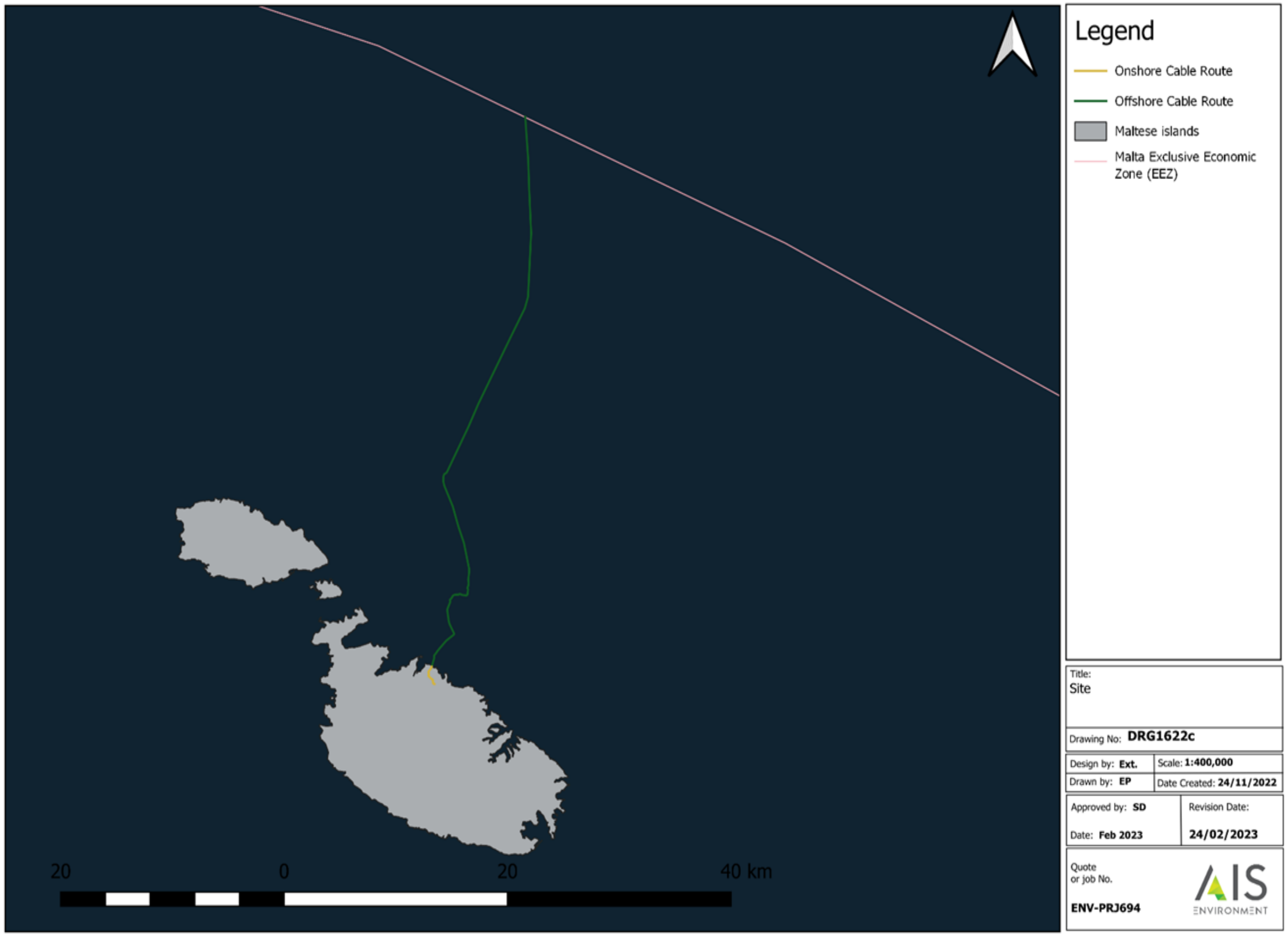

Figure 1: Proposed Interconnector route in the Maltese Exclusive Economic Zone (EEZ)

In order to minimise the environmental impact of the project, the applicant is proposing to make use of the existing transmission station just outside the Ecohive complex, Maghtab, Naxxar. On shore, the cable shall be installed in underground trenches 0.90m wide x 1.6 m deep (Figure 3) passing through or in close proximity to the Ecohive complex which is operated by WasteServ Malta. The onshore and nearshore approaches will be connected via trenchless drilling (Horizontal Directional Drilling) techniques passing underneath the Coast Road (Figure 2) The offshore cable shall be buried beneath the seafloor to a nominal depth of circa 1.5m on the most optimal route and where it will not be possible to cover the submarine cable, it will be protected by means of rock protection/placement.

Figure 2: Proposed HDD (Horizontal Directional Drilling) laydown Area

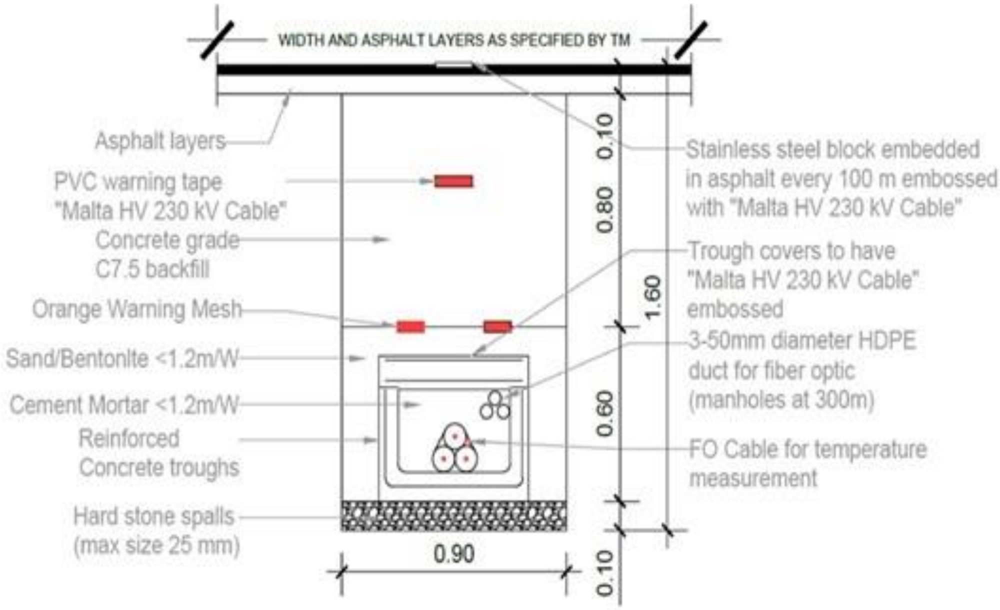

FIGURE 3: TRENCH CROSS SECTION FOR 245KV CABLE CIRCUIT

1.2 SCOPE OF DOCUMENT

The specific aim of this assessment is to summarise the known and potential archaeological baseline within the Scheme area to subsequently inform the EIA.

The objectives of the assessment are to produce details of relevant legislations, national and local planning policy, and best practice guidance and assess the significance of the known and potential archaeological resources through weighted consideration of their valued components.

2 TERMS OF REFERENCE

The ERA issued the Terms of Reference related to the study on architecture, archaeological, historical & cultural heritage and related material assets for the EIA in July 2022. They are replicated hereunder.

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (I.E. ENVIRONMENTAL BASELINE)

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:

1. The geographic area (e.g., viewshed or other area of influence) that needs to be covered by each study;

2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (e.g. residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);

3. The location of the reference points or stations (e.g. viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and

4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).

Note: It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required by Section 4 below. The discussion should cover the following aspects, in the appropriate level of detail:

· Supra-national (e.g. European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;

· National legislation, policies and plans (e.g. Structure Plan; National Environment Policy); and

· Sub-national legislation, policies and plans (e.g. local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).

Note: In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.

3.5 Architecture, Archaeological, Historical & Cultural Heritage and Related Material Assets

Refer to Appendix 2 [Attached to this Technical Study in Appendix 2.]

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/

demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (i.e. if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. An exhaustive identification and description of the envisaged impacts;

2. The magnitude, severity and significance of the impacts;

3. The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (i.e. impacts affecting other countries);

4. The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);

5. Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);

6. A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:

· interactions (e.g. summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;

· interactions or interference with natural or anthropogenic processes and dynamics;

· cumulation of the project and its effects with other past, present or reasonably foreseeable developments, activities and land uses and with other relevant baseline situations; and

· wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);

7. Whether the impacts are adverse, neutral or beneficial;

8. The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;

9. Implications and conflicts vis-à-vis environmentally-relevant plans, policies and regulations;

10. The probability of the impacts occurring; and

11. The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.

The impacts that need to be addressed are detailed further in the sub-sections below.

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMMES

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see Section 1.2.3 above].

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (e.g. after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see Section 5.4 below], where relevant.

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [i.e. impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

5.3 Additional Measures

Compensatory measures (i.e. measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

5.4 Decommissioning Plan

A decommissioning plan (DP) should also be proposed to address the following circumstances, as relevant:

1. Removal of any temporary or defined-lifetime development (or of any structures, infrastructure or land use required temporarily in connection with it) upon the expiry of their permitted duration; and

2. Removal of the development (or of any secondary developments, infrastructure or land use ancillary to it) in the event of redundancy, cessation of operations, serious default from critical mitigation measures, or other overriding situations that may emerge in future.

5.5 Monitoring Programme

A realistic and enforceable programme for effective monitoring of those works envisaged to have an adverse or uncertain impact. The monitoring programme should include:

1. Details regarding type and frequency of monitoring and reporting, including spot checks;

2. The parameters that will be monitored, their units of measurement, the monitoring indicators to be used; and standard analytical methods in line with relevant EU policy;
3. An effective indication of the required action to address any exceedances, risks, mitigation failures or noncompliance for each monitoring parameter;

4. An evaluation of forecasts, predictions and measures identified in the EIA; and

5. An indication of the nature and extent of any additional investigations (including EIAs or ad hoc detailed investigations, if relevant) that may be required in the event of any contingencies, unanticipated impacts, or impacts of larger magnitude or extent than predicted.

The programme should address all relevant stages, as follows:

(a) Where relevant, monitoring of preliminary on-site investigations that may entail significant disturbance or damage to site features (e.g. archaeological excavations, geological sampling, or any works that require prior site clearance or any significant destructive sampling);. [Note: Official written consent from the competent authorities (e.g. Superintendence of Cultural Heritage) may also be required for such interventions.]

(b) Monitoring of the construction phase, including the situation before initiation of works (including site clearance), during appropriate stages of progress, and after completion of works;

(c) Monitoring of the operational phase, except where otherwise directed by ERA (e.g. where monitoring would be more appropriately integrated into an operating permit); and

(d) Where relevant, monitoring of the decommissioning phase, including the situation before initiation of works, during appropriate stages of progress, and after completion of works.

5.6 Identification of required authorisations

The assessment should also identify all environmentally-relevant permits, licences, clearances and authorisations (other than the development permit to which this EIA is ancillary) which must be obtained by the applicant in order to effectively implement the project if development permission is granted. Any uncertainty, as to whether any of these pre-requisites is applicable to the project, should be clearly stated.

Note on Sections 5.1 to 5.6 above:

The expected effects, the proposed measures, the residual impacts, the proposed monitoring etc. should also be summarised in a user-friendly itemised table that enables the reader to easily relate the various aspects to each other.

3 Methodology

3.1 Area of Influence

The Area of Influence (AOI) for the terrestrial component of the study will comprise of a 100m buffer zone around the chosen onshore route of the interconnector cable. The nearshore and offshore AOI will follow the selected interconnector corridor's centreline extending 300m from each side of this proposed centreline. The offshore study area will stop at the boundary of the Maltese Exclusive Economic Zone.

The AOI analysed in this study varies slightly from that presented in the PDS. The reason for this change is a result of further studies carried out for this project since the presentation of the PDS to the ERA. The route has now been finalized and the new AOI analysed the latest route.

The AOI is mapped in Figure 4.

3.1.1 Offshore Section

The Malta Plateau extends southwards from the Hyblaen Plateau in mainland Sicily and has been subjected to continuous subsidence during the Late Miocene-Early Pliocene but has been stable since the Middle Pliocene (Osler & Algan 1999). At the end of the Last Glacial Maximum, the Malta Plateau was flooded by sea level rise which remains submerged today (Micallef et al. 2013). As such, it can be assumed that any potential archaeological remains will exist on the seabed or buried beneath the seabed surface. The proposed route of the cable crosses the Sicily Channel and the Malta Plateau and will measure approximately 97km between Magħtab (Malta) and Marina di Ragusa (Sicily).

A variety of methods have been used to survey the seafloor to identify any features of archaeological interest within the proposed interconnector corridor.

- Multi-Beam Echo Sounder (MBES)
- Sub Bottom Profiler (SBP)
- Side Scan Sonar (SSS)
- Magnetometer
- ROV visual surveys

3.1.2 Onshore Section

The onshore section of the project encompasses the Magħtab area, situated on the Northeast coast of the main Island of Malta, within the locality of Naxxar. This area comprises stretches of exposed outcrops of Lower Coralline and Globigerina Limestone geology between cultivated terraced fields lying across gently sloping hills. Other land use includes the Magħtab landfill, which is the largest such site in the Maltese Islands. The area is situated below (just North of) the great fault. During the Early Modern period, the area between Magħtab and Salina Bay also served a defensive purpose, as is demonstrated by the Għallis Tower, the Għallis Battery, the

Qalet Marku Battery, the fougasse (a rock-hewn mortar), and the adjacent Ximenes Redoubt (Freller, 2010).

A 100m buffer zone was established as the AoI around the approximately 2km long onshore stretch of the interconnector. The methodology employed for the assessment of the cultural heritage in this area first involved a desktop study, including a thorough review of the literature and previous reports. A subsequent site inspection was conducted on the 23rd of February 2023. Details, including descriptions of the cultural heritage features in the area, are available in Appendix I. With regards to further details on the known archaeological assets within the AoI (see Figure 50) Superintendence was contacted but no such information was forthcoming and nothing further exist in the SCH publications.

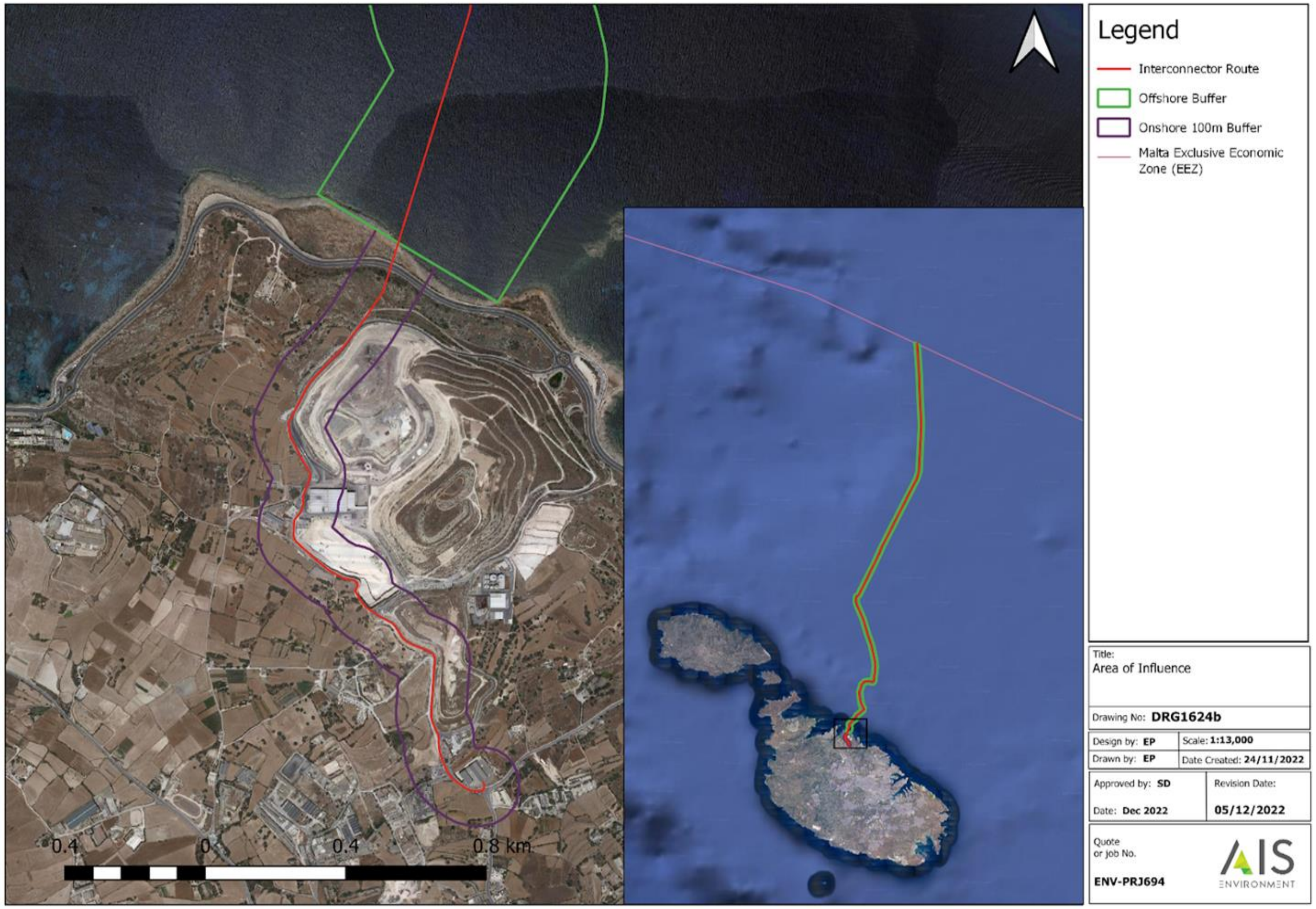

Figure 4: Plans of the offshore and onshore area of influence

3.2 Literature Review

A number of publicly accessible sources of primary and synthesised information were consulted, including:

1. National heritage datasets including the National Inventory for Malta and Scheduling (HS) constraints available on the Planning Authority (PA) Geoportal;
2. Relevant mapping including survey maps and Local Plans;
3. Relevant documentary sources, including Museum Annual Reports (MAR) and grey literature.

A bibliography of documentary, archive, and cartographic sources consulted is included in the References section of this report.

3.3 Offshore SectionSurveying Methodology

A variety of methods were used to survey the seafloor to identify any features of archaeological interest within the proposed interconnector corridor.

- Multi-Beam Echo Sounder (MBES)
- Sub Bottom Profiler (SBP)
- Side Scan Sonar (SSS)
- Magnetometer
- ROV visual surveys

The SBP together with the magnetometer enabled any buried features in the survey area to be identified. In contrast, the other methods focused on the identification of objects lying on/above the seabed.

3.3.1 Nearshore

The Nearshore Malta Geophysical survey was carried out by the Maltese Flag vessel M/B Wilfred.

The vessel main technical specs are detailed in the table below.

Table 1: Nearshore Malta Survey vessel m/b wilfred technical specs (Source: Section 5.1.2 of Fugro PMRS Geophysical Report)

Name	M/B Wilfred
Flag	Maltese
Built	2001
LOA	11,0 m
Breadth	4,88 m

NAME	M/B Wilfred
DEPTH	1,50 m
HULL	Glass Fiber

At the landing areas, a geophysical acquisition up to 1 nautical mile from the shoreline was carried out.

The Nearshore Geophysical Survey acquisition was carried out separately between MBES-SSS and SBP-MAG.

- MBES & SSS: was run following lines spaced between 40m, in water depth from 5m to 10m, and 60m, in water depth greater then 10m, to ensure full data coverage for SSS and complete overlap of the nadir area of adjacent lines.
- SSS: in area shallower than 10m the SSS was acquired with a 50m range and in area greater than 10m of water depth the acquisition range was up to 75m. In any case resolution is equal or greater than 0.3x0.3m.
- MBES: data was acquired with full coverage of the seabed. MBES backscatter data was also acquired.
- MBES-SSS cross lines was performed with the only purpose of cross check and data quality control.
- SBP-MAG, data was acquired following run lines spaced 10m (parallel to the coast). SBP cross lines was carried out at 200m spacing.

The line plan is described in Table 2 below.

TABLE 2: NEARSHORE MALTA GEOPHYSICAL SURVEY –LINE PLAN (SOURCE: SECTION 5 OF FUGRO PMRS GEOPHYSICAL REPORT)

DESCRIPTION	NO. OF LINES	DIRECTION	LENGTH	LINE SPACING
SSS-MBES	No. 40 lines	Parallel to the coast	Length varying from 68 m to 1526 m	40m in water depth from 5m to 10m 60m in water depth greater then 10m
SBP-MAG	No. 200 lines	No. 191 main lines parallel to the coast No. 9 SBP cross lines	Length varying from 25m to 1582 m	10 m line spacing for the main lines 200m line spacing for

Description	No. of lines	Direction	Length	Line Spacing
				the cross lines
			Approx Tot km	252.5

Additionally, the following equipment and requirements was used for the above-mentioned surveys.

Table 3: Equipment details (Source: Section 5.2.3 of Fugro PMRS Geophysical Report)

Item	Description
Multibeam Echosounder	Norbit Winghead i77h Ultra High Resolution 400kHz, 200-700kHz frequency selectable or equivalent
Side Scan Sonar	KLEIN 4900 double frequency 455/900 kHz or equivalent
Sub Bottom Profiler	Kongsberg Geoacoustic Pulse Compact
Magnetometer	GEOMETRICS G882 Magnetometer
Processing Software	QIMERA or equivalent for MBES processing
	SonarWiz for SSS/SBP and Mag processing and interpretation
Survey limits:	0m to 32 m
Approx. Survey Area:	1700 m x (1950 – 600) m
Minimum overlap with offshore survey	100 m
Minimum Overlap of data	100% SSS until 32 m w.d. 75% SSS ≥ 30 m w.d 15% of a single MBES swath
Multibeam	Accuracy: within 0,56 to 1.0% of water depth Final grid density: minimum 1 node until 30m w.d. 1node/1.0 m. At maximum w.d. (approx. 160m) grid density of 1 node/5.0 m will be acceptable
Side Scan Sonar	Minimum number of pings=3 0.3m x 0.3m resolution is required up to 32 m w.d.
Sub Bottom Profiler	Minimum 15 m penetration (the penetration is depending on the biological and geological conditions of the survey area) High resolution for the first 6m sediment

Item	Description
Magnetometer	To be used along the entire route to detect anthropogenic and ferrous based objects and materials

The bathymetric information of the inshore area (0-8 m), that could not be reached by the nearshore geophysical survey vessel, was acquired by the same Multibeam Echosounder (Norbit) installed on a compact zodiac RIB.

The line plan for the very shallow acquisition was as described below.

Table 4: Nearshore Malta Geophysical Survey – Line Plan For Very Shallow Waters (Source: Section 5 of Fugro PMRS Geophysical Report)

Description	No. of lines	Direction	Length	Line Spacing
MBES Backscattering	No. 36 lines	Parallel to the coast	Length varying from 37 m to 847 m	10 meters
			Approx Tot. km	**5.8 km**

A total of 5 ROV transects were surveyed in the Maltese nearshore area along areas (Figure 5).

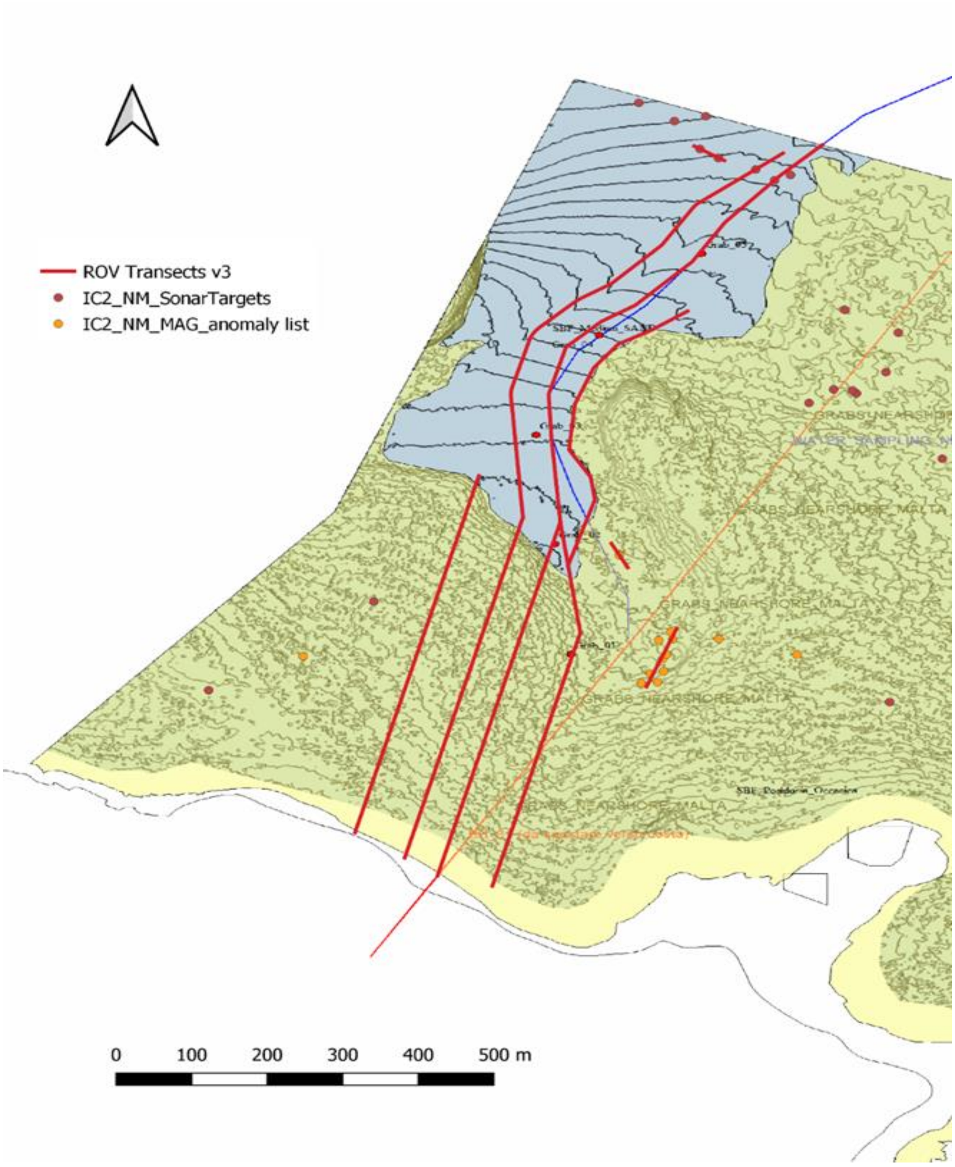

FIGURE 5: MAP OF TRANSECTS SURVEYED WITHIN THE MALTA NEARSHORE AREA.

3.3.2 Offshore ROV

Three offshore transects were also surveyed. One transect was carried out along the centre path of the corridor route, and one on either side ca, 150m away from the centre line. The ROV surveys were only carried out around the remote sensing targets and other interesting areas identified during the survey. Following the completion of the geophysical survey, ROV surveys were carried out around areas and targets of interest identified during the survey. The offshore geophysical survey as well as the ROV visual inspection survey were carried out by the Italian Flag vessel S/V Urbano Monti.

The vessel main technical specs are detailed in the table below.

TABLE 5: OFFSHORE SURVEY VESSEL S/V URBANO MONTI TECHNICAL SPECS (SOURCE: SECTION 5.2 OF FUGRO PMRS GEOPHYSICAL REPORT)

NAME	S/V Urbano Monti
FLAG	Italian
BUILT	2007
IMO NO	9344215
LOA	60,0 m
BREADTH MOULDED	15,60 m
DRAFT MOULDED	4,50 m
GROSS TONNAGE	1969 tons

SSS, SBP and MBES lines were surveyed every 150 m parallel to the cable and every 1000 m spaced perpendicular to the cable, based on the below line plan.

In addition, no. 5 Magnetometer main lines, 10 m spaced in a 40 m corridor, centred on the route were run.

Following the acquisition of the above data, it was decided to extend the survey corridor in certain areas that proved to have challenges for cable routing.

TABLE 6: OFFSHORE SURVEY LINE PLAN FOR MBES, SSS, SBP, MAG (SOURCE: SECTION 5 OF FUGRO PMRS GEOPHYSICAL REPORT)

DESCRIPTION	LINES NO.	DESCRIPTION	TOT KM
MBES, SSS, SBP & MAG	3 Main Lines (103 km long and 100 Cross Lines (600m long))	Main lines: 150 m spaced + infill Cross lines: 1000 m spaced	Approx. 440
MAG	100 Cross Lines (600 m long)	1000 m spaced	Approx. 380
MBES, SSS, SBP & MAG	Extra work in areas of interest within the original corridor	As needed	Approx. 419
		TOTAL	1239 incl. infill

The table below lists the geophysical survey equipment and requirements.

TABLE 7: GEOPHYSICAL OFFSHORE SURVEY EQUIPMENT (SOURCE: SECTION 5.2 OF FUGRO PMRS GEOPHYSICAL REPORT)

ITEM	DESCRIPTION
Positioning Reference System	Kongsberg K-POS 21 + CJOY
	HIPAP 502 Kongsberg
	Kongsberg type DPS 112, Kongsberg type DPS 114
	Kongsberg MRU-D Motion Reference Unit
	Master Gyro Compass C. Plath Navigat X Mk1 Mod 10
	Gill Ultrasonic Wind sensor
Multibeam	Kongsberg EM122 Kongsberg EM2040
SVS (x2)	Valeport Mini SVS+ Valeport Midas-CDT
Positioning System Kongsberg	Seapath 380-5
Online Data Navigation System	QUINSy Survey Planning, Acquisition, Real-time software
SSS/SBP	Edgetech-2000-FS – Combined Side Scan Sub Bottom System
SSS/SBP/acquisition Mosaicking Software	Cheaspeake Sonar Wiz
MAG	Geometrics G882 interfaced with SSS
Offline MBES Data Processing System	QPS QIMERA
Projecting software	Autochart – Autocad
Database Management Software	Geomedia
Survey limits:	30 m to 170 m
Corridor Width:	600 m x 103 km (approx. 50% in Maltese waters)
Minimum overlap between areas	100 m
Minimum Overlap of data	100% SSS until 30m w.d. 75% SSS ≥ 30 m w.d

ITEM	DESCRIPTION
	15% of a single MBES swath
Multibeam	Accuracy: within 0,56 to 1.0% of water depth Final grid density: minimum 1 node until 30m w.d. 1node/1.0 m. At maximum w.d. (approx. 160m) grid density of 1 node/5.0 m will be acceptable
Side Scan Sonar	Minimum number of pings=3 0.3m x 0.3m resolution is required up to 30 m w.d.
Sub Bottom Profiler	Minimum 15 m penetration High resolution for the first 6m sediment depth for identification of CHOs
Magnetometer	To be used along the entire route to detect anthropogenic and ferrous based objects and materials

Following the completion of the geophysical survey, ROV surveys were carried out around areas and targets of interest identified during the survey (see Section 5.3).

3.3.3 Onshore Section

3.3.4 Site Inspection

The Scheme area was surveyed on the 23rd February 2023. The aim of the inspection was to systematically identify and record any cultural/historical features visible in the landscape and identify potential for unknown cultural heritage assets

There were several areas within the buffer zone of the scheme that were inaccessible as they were on private lands and surrounded by fencing. However, these areas were assessed remotely with the use of a drone and furthermore they should not have any impact on the study.

A photographic record using a Canon EOS 1100D camera with EF-S 18-55mm zoom lens and a DJI Mini 2 Drone was made for each area visited and any identified cultural heritage assets.

4 LEGISLATION AND STATUTORY PROTECTION

The following section provides a summary of the national, regional and local planning, and legislative framework governing the protection and treatment of cultural heritage within the planning process.

The archaeological curator responsible for archaeological resources up to the 12 nautical mile limit, is the Superintendence of Cultural Heritage. This unit is responsible for managing and ensuring that the protection and accessibility of cultural heritage as defined in the Cultural Heritage Act 2001, is carried out.

4.1 DEVELOPMENT PLANNING ACT 2016

This Act aims at implementing a comprehensive planning system by means of a Spatial Strategy which regulates "the sustainable management of land and sea resources covering the whole territory of the Maltese Islands" (44.1). As per Directive 2014/52/EU (which supersedes Directive 2011/92/EU), Environment Impact Assessments are required to provide high level protection to the environment and human health and ensure that projects which are likely to have significant effects on the environment are adequately assessed before any development consent is granted.

Relevant to this assessment is the Subsidiary Legislation 552.01 of the Development Planning Act 2016 dealing with Rubble Walls and Rural Structures (Conservation and Maintenance). Rubble walls and non-habitable rural structures are protected, "in view of their historical and architectural importance, their exceptional beauty, their affording a habitat for flora and fauna, and their vital importance in the conservation of the soil and of water" (2).

4.2 STRUCTURE PLAN FOR THE MALTESE ISLANDS 1990

The Structure Plan for the Maltese Islands was drafted in 1992, with the aim to control development and channel it into existing and committed urban areas and improve the quality of all aspects of the environment of both urban and rural areas. Heritage falls under Chapter 13. Tourism and Recreation. However, it is largely dealt with in Chapter 15. Conservation. This section clearly sets out criteria to determine areas/assets of cultural significance, including Urban Conservation Areas; Listed Buildings; Rural Conservation Areas; Areas and Sites of Archaeological Importance; and Marine Conservation Areas.

4.3 CULTURAL HERITAGE ACT 2002

The management and protection of cultural heritage is legally covered by the Cultural Heritage Act 2002.

Cultural heritage is defined as "movable or immovable objects of artistic, architectural, historical, archaeological, ethnographic, palaeontological and geological importance and includes information or data relative to cultural heritage pertaining to Malta or to any other country. This includes archaeological, palaeontological or geological sites and deposits, landscapes, groups of buildings, as well as scientific collections, collections of art objects, manuscripts, books, published material, archives, audio-visual material and reproductions of any of the preceding, or collections of historical value, as well as intangible cultural assets comprising arts, traditions, customs and skills employed in the performing arts, in applied arts and in crafts and other intangible assets which have a historical, artistic or ethnographic value (Part 1.2)

Part 3 of the Act states that "an object shall not be deemed to form part of the cultural heritage unless it has existed in Malta, including the territorial waters thereof, or in any other country, for fifty years, or unless it is an object of cultural, artistic, historical, ethnographic, scientific or industrial value, even if contemporary, that is worth preserving".

4.4 Local policy

The Maghtab Landfill area, within the Naxxar Council boundaries, is under The Central Malta Local Plan (CMLP 12.1.3), classified as Rural/ODZ Area with an existing Landfill site and an Engineered Sanitary Landfill site towards the main transport Network route (arterial) CG38, a Heritage trails and Walkway route CG26 and the Coastal Area NA04 (Map SE1 and NAM3 on PA Local Plan Details).

The policy map CV1, identifies listed Areas of Scientific and Ecological Importance (CG22), a protected Natural Coast with public access towards North and a Protected Area of Hydrological Importance towards South, while the Naxxar Coastal and Rural Environment Constrains Map NAM10, within the Naxxar Local Plan, shows listed archaeological areas/sites with buffer areas, listed ecological sites, scheduled areas, protected natural coast with public access and listed areas/sites of scientific importance.

5 Baseline Survey

5.1 Desktop study

The accessibility of an archaeological site lends itself to the developed recording methods, and subsequently, the development of the field. As such, research into underwater archaeological sites is a much more recent phenomenon, largely stemming from developments in diving equipment. Before the establishment of underwater archaeology as a discipline in Malta, archaeological artefacts were typically recovered from the seabed by fishermen, amateur sports divers and other individuals not affiliated with a scientific or archaeological institute (Azzopardi & Gambin, 2012). More recently however, the development of international and national legislation related to underwater archaeology and archaeological impact assessments has led to an increase in controlled surveying, excavation and desk-based studies of these underwater sites.

The following section of the report will summarise the history of both the Magħtab area and the Malta-Sicily Channel. The main reported archaeological finds were examined with numerous sources of information consulted, such as:

- Documentary;
- Cartographic;
- Reports of any previously discovered archaeological material; and
- Existing literature related to the cultural heritage and history of the study area.

Data used to compile this report consists of secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this Study. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

The records held by the SCH on the geoportal are not a record of all surviving heritage assets, but a record of the discovery of a wide range of archaeological and historical components of the historic environment. The information held within it is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown.

5.1.1 Prehistory

Due to the passage of time and the intensification of land uses in the area, it can be particularly difficult to reconstruct the coastal landscape in prehistoric times. Gambin (2005) demonstrates that the prehistoric landscape of Malta may well have been drastically different than that of today and the environment has experienced numerous and significant changes over the millennia (Mariner et al, 2012). In fact, archaeological indicators in Malta, including cart ruts and Garum production sites, indicate that modern sea levels are higher than those of prehistoric periods (Furlani et al, 2013). Sea level change has also factored significantly into the alteration of the prehistoric landscape of the Malta-Sicily Channel. During the Last Glacial Maximum

(LGM), Malta was connected to Italy via a land-bridge, however following sea level rise, Malta was subsequently cut off from the European mainland around 14500 years BP (Alexander, 1988; Furlani, et al, 2013). Prehistoric shipwreck assemblages of obsidian off of the coast of Pantelleria demonstrate the effect sea level change has had within the larger Sicily Channel (Abelli, et al., 2014). This is further demonstrated by the discovery of a submerged monolith within the Sicily Channel dated to the Mesolithic Period (Lodolo & Ben-Avraham, 2015).

Close to the Magħtab area specifically, other than sea level change, riverine sedimentation has had a significant impact on the coastline since Prehistory, as the Modern Burmarrad plain formed over time replacing a once much larger Salina bay (Marriner et al., 2012). This larger inlet once more sheltered and is thought to have been an important port in ancient times (Marriner et al., 2012).

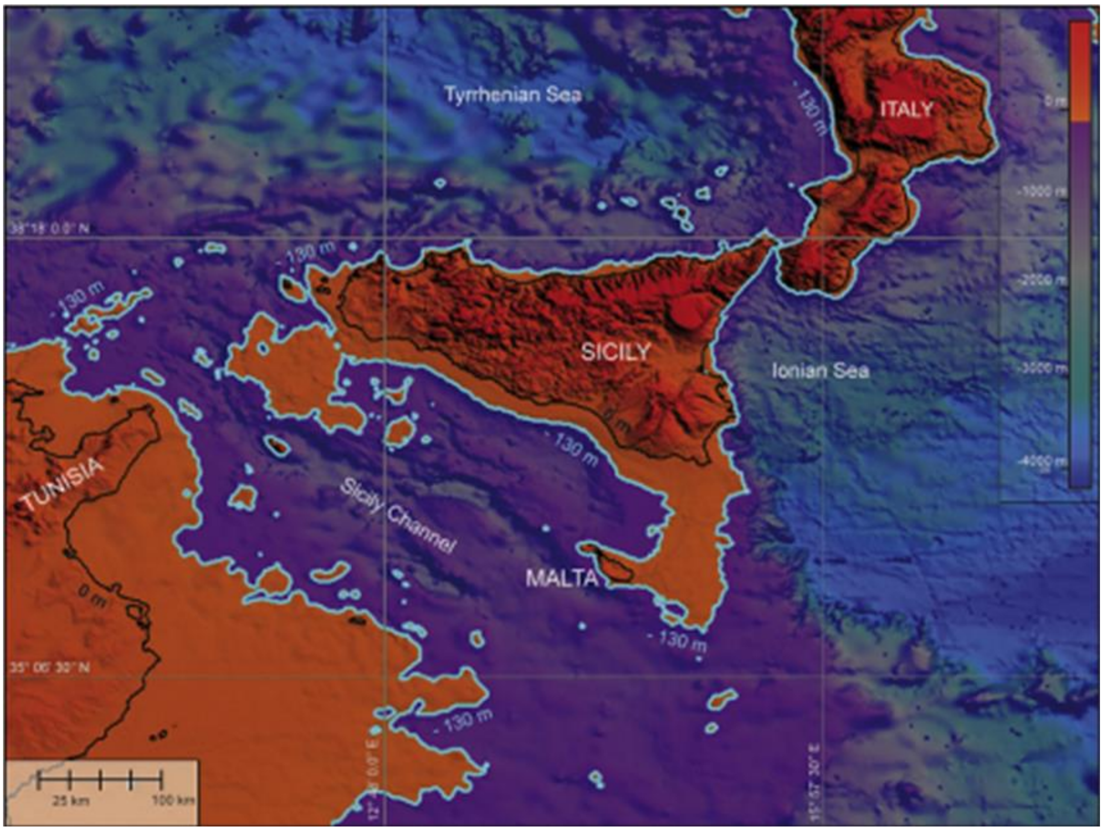

FIGURE 6: LAND BRIDGE BETWEEN SICILY AND MALTA (SOURCE: FURLANI, ET AL, 2013)

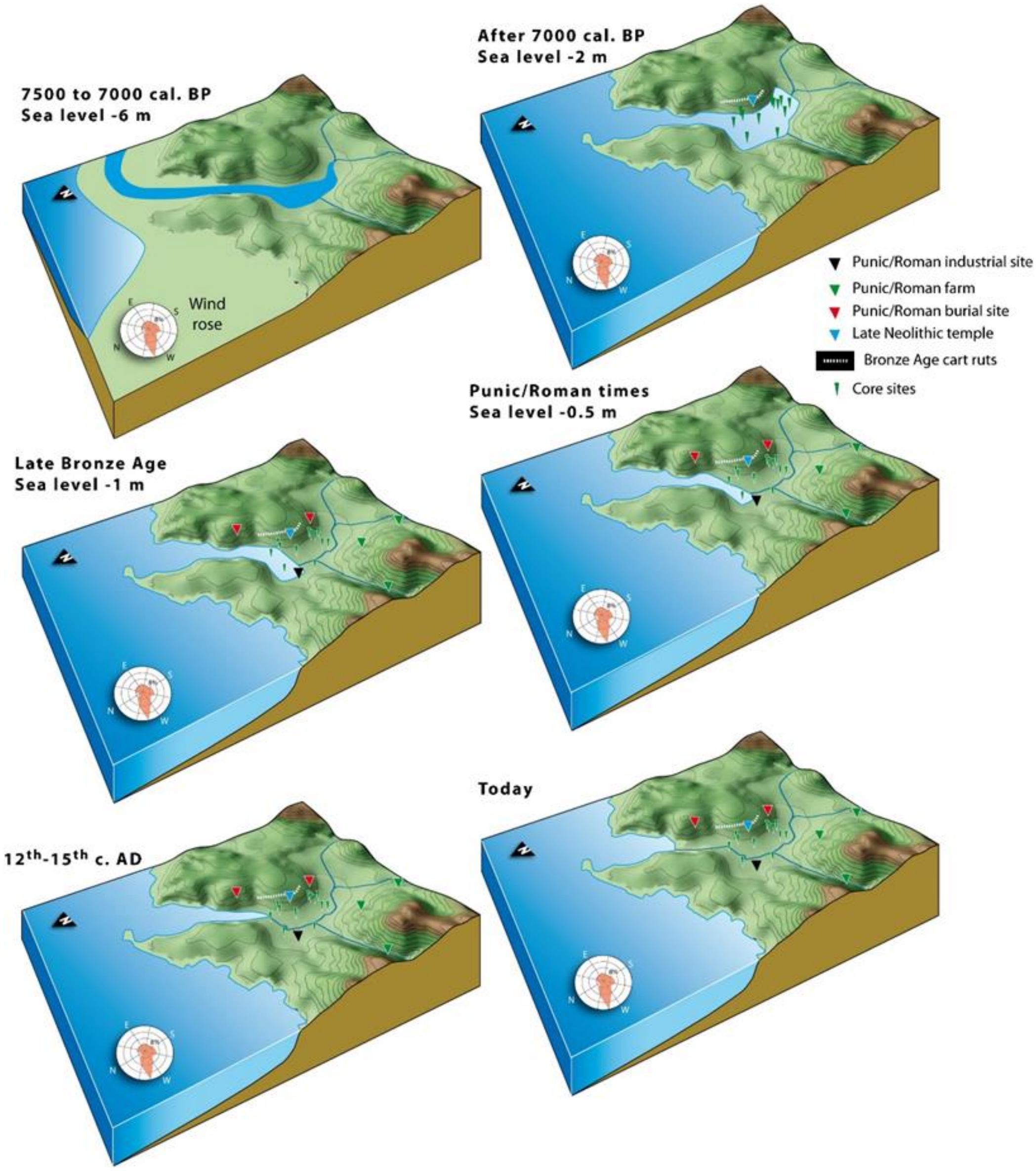

FIGURE 7: PROGRADATION OF THE BURMARRAD RIA, SHOWING THE PROGRESSIVE DECLINE OF THE BAY. THE MAGĦTAB AREA OCCUPIES THE TOP PART OF EACH RENDERING. (MARRINER ET AL. 2012)

The most conspicuous element of Prehistoric activity in the Magħtab area are the several remaining dolmen (Bronze Age megalithic burials), which date to the period (mar 1927-28; Trump 2004). These preserve very scant traces of dateable cultural remains, and hence are difficult to date and interpret comprehensively. The area between the Magħtab area and Salina also contain the characteristic cart ruts, which possibly also date to the Prehistoric period, however this has never been confirmed (Trump 2008). The function of these ruts is still disputed, however the generally accepted interpretation views them as remnants of ancient trackways. The ruts which have been discovered in this area have also tentatively been traced to progress towards and over the great fault, disappearing beneath residential areas in San Pawl tat-Tarġa (Trump 2008). Also in the Salina Bay area is the Tal-Qadi megalithic temple, which despite being smaller than its more well-known contemporaries (e.g. Ħaġar

Qim and Ġgantija), nevertheless demonstrates that this area was also an important centre of activity during the Temple Period. This site was also the location for the discovery of several important cultural artefacts, including an ancient carved representation of the night sky (Trump 2004; Sagona 2015).

5.1.2 Antiquity

The aforementioned Salina Bay is thought to have been an important port in Antiquity, having been much larger even in Classical times, and thus very sheltered (Marriner et al. 2012). Surviving historical documents demonstrate the use of Malta's natural harbours in antiquity, when during the mid-first century BC, Diodorus Siculus described their use. Linking the use of the harbours and the Phoenicians, he states that Malta "possesses many harbours which offer exceptional advantages" (Gambin, 2015, p.7). He continues to draw a comparison between the prosperity of the islands' inhabitants and the fact that Malta is "well supplied with harbours".

The Ancient utilisation of Salina Bay as a harbour is attested by the several ancient shipwrecks and anchors discovered in the Bay, as well as the prevalence of ancient pottery scatters which have been found on the seabed (see Figure 9).

The Magħtab area also contains notable traces of activity from Antiquity, namely made up of surface stone quarries and many rock-cut chamber tombs and catacombs (See Figure 1Figure 9 and Figure 50). These are in many cases related, with rock-cut tombs being excavated in the sides of quarries, which present ready surfaces for rock-cutting (Bonanno 2005). The quarries are difficult to date directly, and many of the tombs in this area were looted before their discovery in modern times. Nevertheless, the Salina catacombs are known to date to the Late Roman and Byzantine periods (between the third and 6th centuries AD) (Bonanno 2005). The quarries which these catacombs were cut into, hence date to an earlier time.

The Malta-Sicily Channel would have also underpinned much of this human activity in the Salina bay and Magħtab area by representing an ideal shipping route for vessels departing from mainland Europe and Sicily. This greatly valued shipping route is also reflected in the material found in shipwreck assemblages within the Sicily Channel. Examples include the Byzantine-era Marzamemi 'church wreck', which was carrying architectural elements for assembly somewhere in North Africa and sank off the south-eastern coastline of Sicily (Leidwanger & Greene, 2016). Additionally, a sixth-century BC shipwreck off Gela, was found to be carrying 40 orichalcum ingots, a valuable type of brass, which would have been a great loss at the time of the ship's sinking (Caponetti, et al, 2017). As such, the presence of these shipwrecks carrying valuable types of materials throughout the Sicily Channel, stands testament to this invaluable ancient trade network.

5.1.3 Middle Ages

During the Middle Ages, Sicily, and by extension the channel, plays an important role in the facilitation of the invasion of Malta. This includes Muslim invaders, originating from North Africa, in the ninth century and Norman invaders led by Roger I in 1091 (Atauz, 2004). While the Sicily Channel clearly represented the possibility and means of conquest during the Middle Ages, it also provided a means for transport of goods and services. This exchange and interaction of cultures is manifested in shipwrecks from this period within the Sicily Channel, especially that of the Contrada Bambina located off the south of Marsala. This twelfth Century shipwreck contains within its contents a bronze pail with an inscription in early Arabic from the Qur'an (Bramoullé, et al, 2017; Ashmolean Museum of Art and Archaeology, 2016). As such, the Sicily Channel experienced turbid environments, supporting opportunity through territorial expansion or through monetary gain with other cultures.

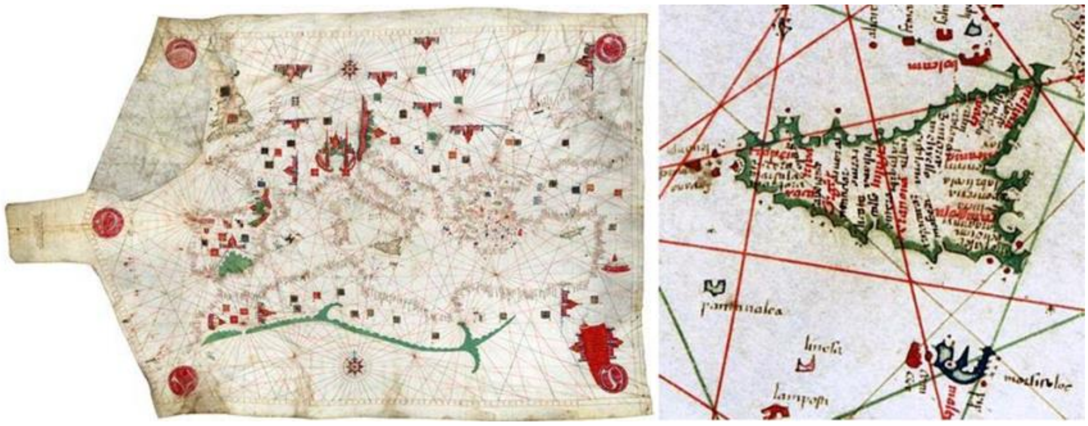

FIGURE 8: PORTOLAN DEPICTS MALTA AND SICILY DRAWN ON VELLUM (SOURCE: GAMBIN, 2008)

Traces of activity from the Medieval period are rather scarce for the Magħtab area. The closest evidence comes from the San Brincat (Għargħur) troglodytic settlement, situated in a valley set within the Great Fault (Dalli 2006). This site is located in close proximity to a natural freshwater spring, and is thought to have possibly been a centre of Medieval Siculo-Greek monasticism (Dalli 2006).

5.1.4 Early Modern

During the Late Medieval and Early Modern periods, numerous attacks were made on Malta by North African corsairs, rendering the coastline largely bereft of settlements (Freller 2010). As a result, the low-lying coastline around Il-Magħtab and the sheltered bay of Salina, saw a drastic increase in the investment in coastal defenses, particularly by the Knights of St. John (Freller 2010). Many of these survive, including the Għallis Tower, at the tip of the promontory, opposite Qawra, the Għallis Battery, the Qalet Marku Battery, as well as the Ximenes Redoubt and the associated rock-hewn mortar (fougasse).

Apart from its increased military significance, the Salina area played an increasing importance in the local economy as the salt panning industry was expanded under the Knights of St. John. This included significant investment in the salt panning facilities by the Knights, which are in use till this day (Marriner et al. 2012).

During the Early Modern period, several chapels were built in the Magħtab area, including that dedicated to the Annunciation in the Salini hamlet, and those dedicated to St Michael and to the Assumption of the Madonna (see Figure 9).

5.1.5 Modern

Following the takeover of the Maltese Islands by the French and subsequently the British, the area retained its defensive importance. As a matter of fact, during the Second World War, several new defenses were built in the area (including numerous beach posts), and others, including the Għallis Battery were reinforced and augmented with modern anti-aircraft weaponry. A bomb shelter was also excavated in the Salina hamlet (see Figure 9).

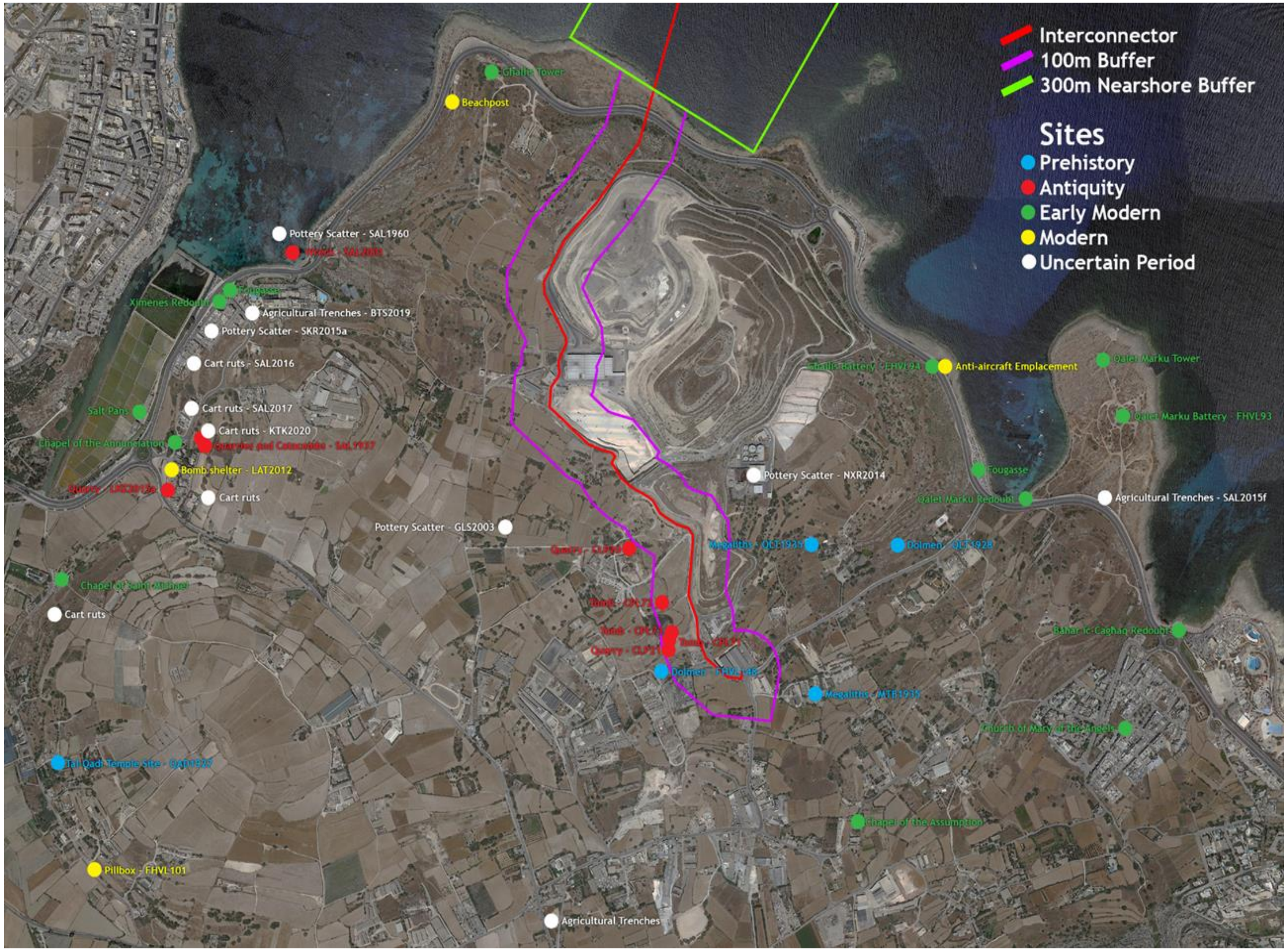

FIGURE 9: MAP SHOWING THE INTERCONNECTOR'S ONSHORE AREA OF INFLUENCE (100M BUFFER), OVERLAIN BY ALL KNOWN ARCHAEOLOGICAL SITES AND CULTURAL HERITAGE FEATURES

5.2 Disturbance Factors

Before examining the discoveries within the study area, it is of importance to consider the various site formation processes and potential disturbance factors that may affect any archaeological deposits present within the area, both underwater and onshore, as outlined hereunder.

5.2.1 Unexploded Ordnance (UXO)

Given Malta's heavy bombing during World War II and the flight path of Italian bombers over the Malta-Sicily Channel, there is a strong possibility of encountering UXO and munitions within the sediments. Consequently, there is a risk of severe disturbance of multiple sediment levels by exploding bombs, especially if shipwrecks and crashed aircraft are encountered.

5.3 Offshore Survey and Discoveries

This section summarises any archaeological remains discovered during the course of the desk-based assessment within the Area of Influence. In addition, archaeological finds or sites within the immediate vicinity of the AoI will be discussed so that the AoI will be considered in relation to its surroundings.

The Area of Influence was comprehensively surveyed as indicated within the methodology. Targets were then further investigated with the ROV with imagery of the objects collected. A variety of material was uncovered in the course of this survey ranging from objects of modern anthropogenic origin to those of likely probable cultural heritage. The next section will summarise the relevant identified targets.

The Offshore survey identified a number of targets (3 designated main targets of notable archaeological value and many more minor targets of limited to no archaeological value) on the seabed. All of the main targets are situated within the Maltese EEZ. Among there were most notably two World War 2 German aircraft wrecks (One Ju 87 and one Ju 88).

In addition, a single large cluster of UXOs, also presumably from World War 2, was identified. Apart from this cluster, many smaller clusters and single examples of UXOs were also found.

The photos of the targets are shown in Figure 10 to Figure 18.

TABLE 8: MAIN TARGETS DESCRIPTION

MAIN TARGET	DESCRIPTION	COORDINATES	SUGGESTED PERIOD	SURVEY TRANSECT
1	Wreck of Junkers Ju 88	Confidential	World War 2	R-21-TR-03
2	Wreck of Junkers Ju 87	Confidential	World War 2	R-12-TR-05
3	Dense cluster of UXOs	Confidential	World War 2	ROV-Route-03, Dive N. 34

5.3.1 Main Target 1 – Junkers Ju 88 Wreck

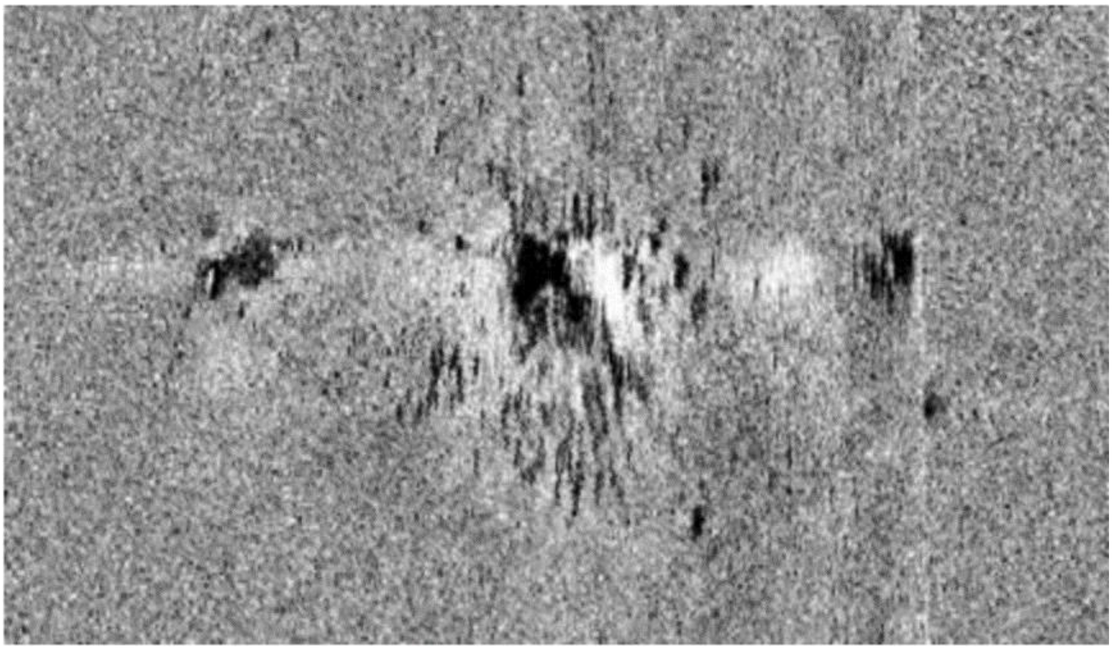

FIGURE 10: SSS RENDERING OF THE AIRCRAFT WRECK (MAIN TARGET 1, A JUNKERS JU 88)

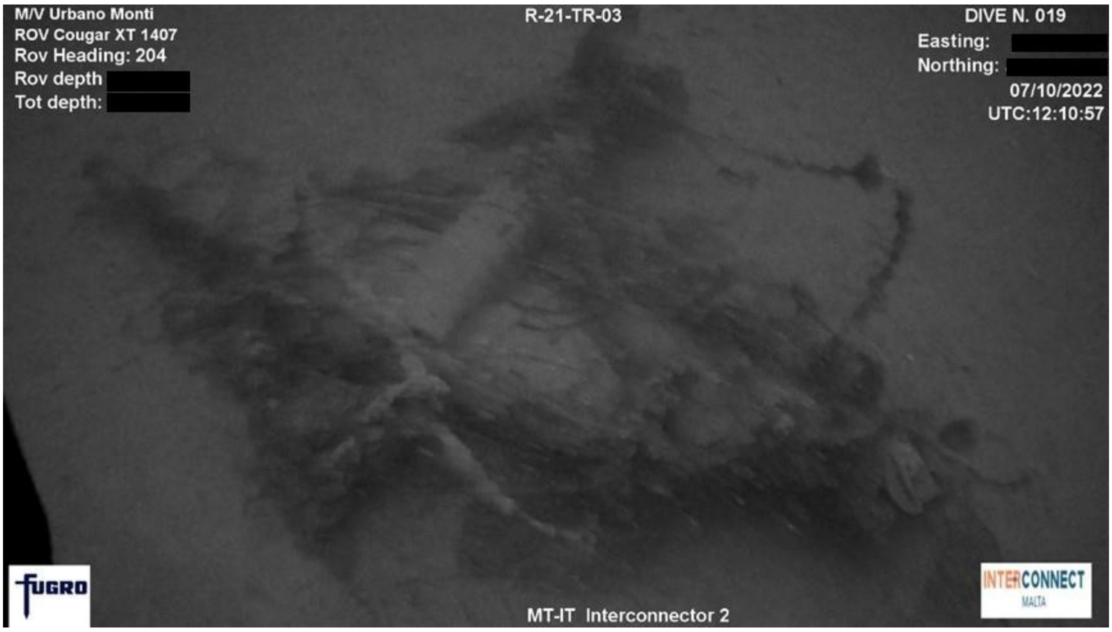

FIGURE 11: PHOTO OF THE AIRCRAFT TAKEN DURING THE ROV SURVEY

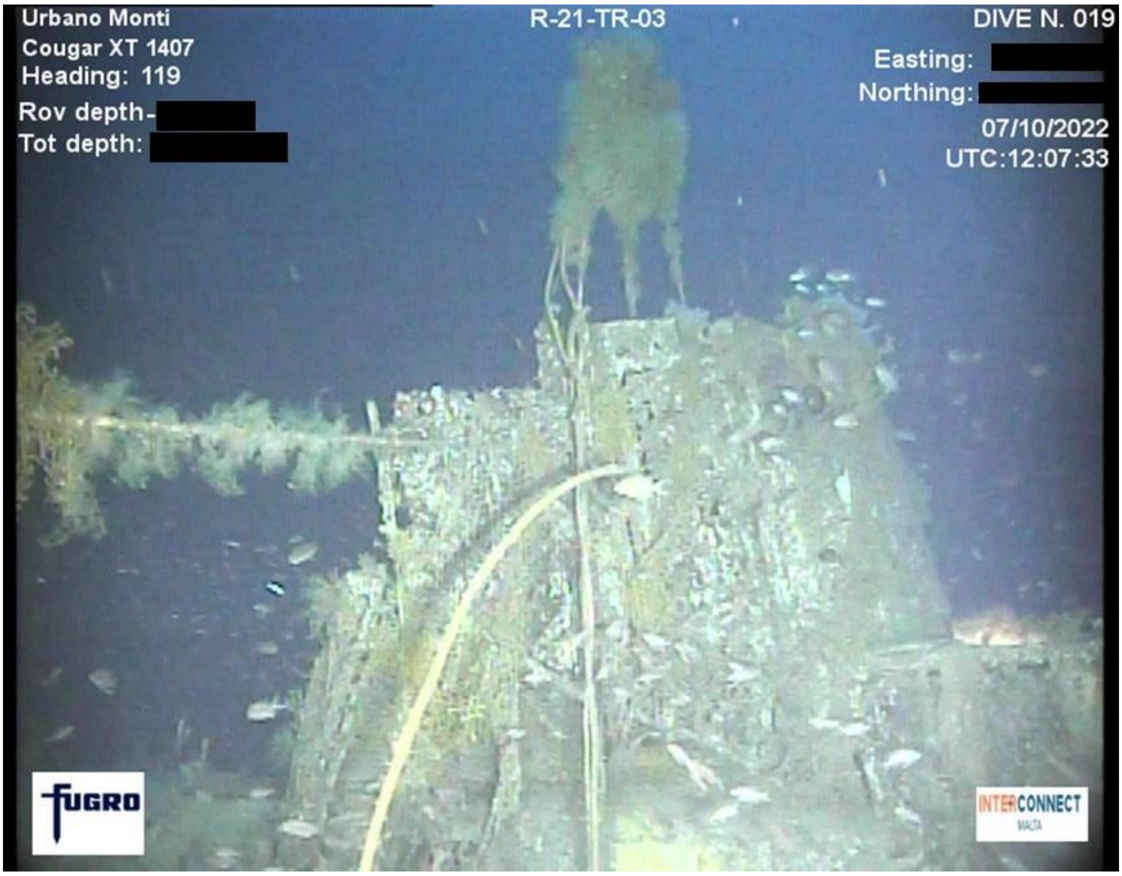

FIGURE 12: ROV PHOTO OF THE BROKEN TAIL OF THE AIRCRAFT

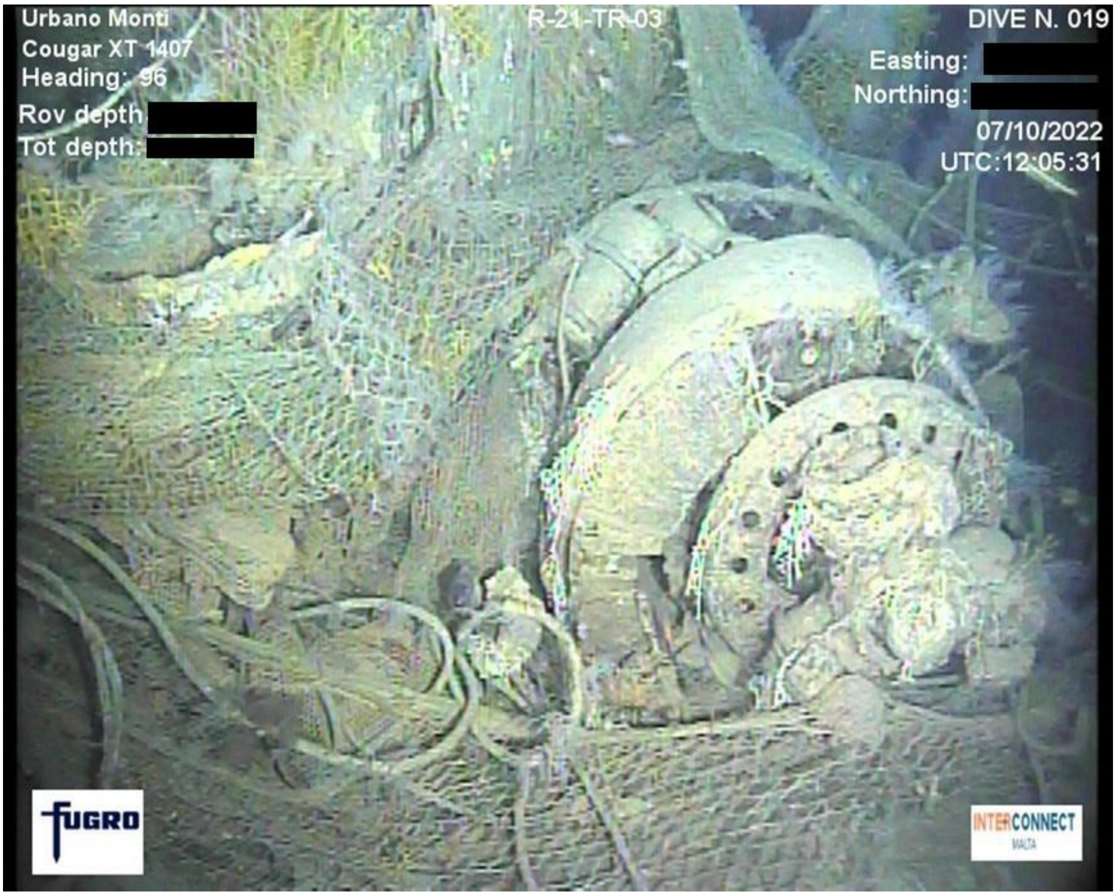

Figure 13: ROV photo of one of the aircraft's engines, which has become entangled in fishing nets

5.3.2 Main Target 2 – Junkers Ju 87 Wreck

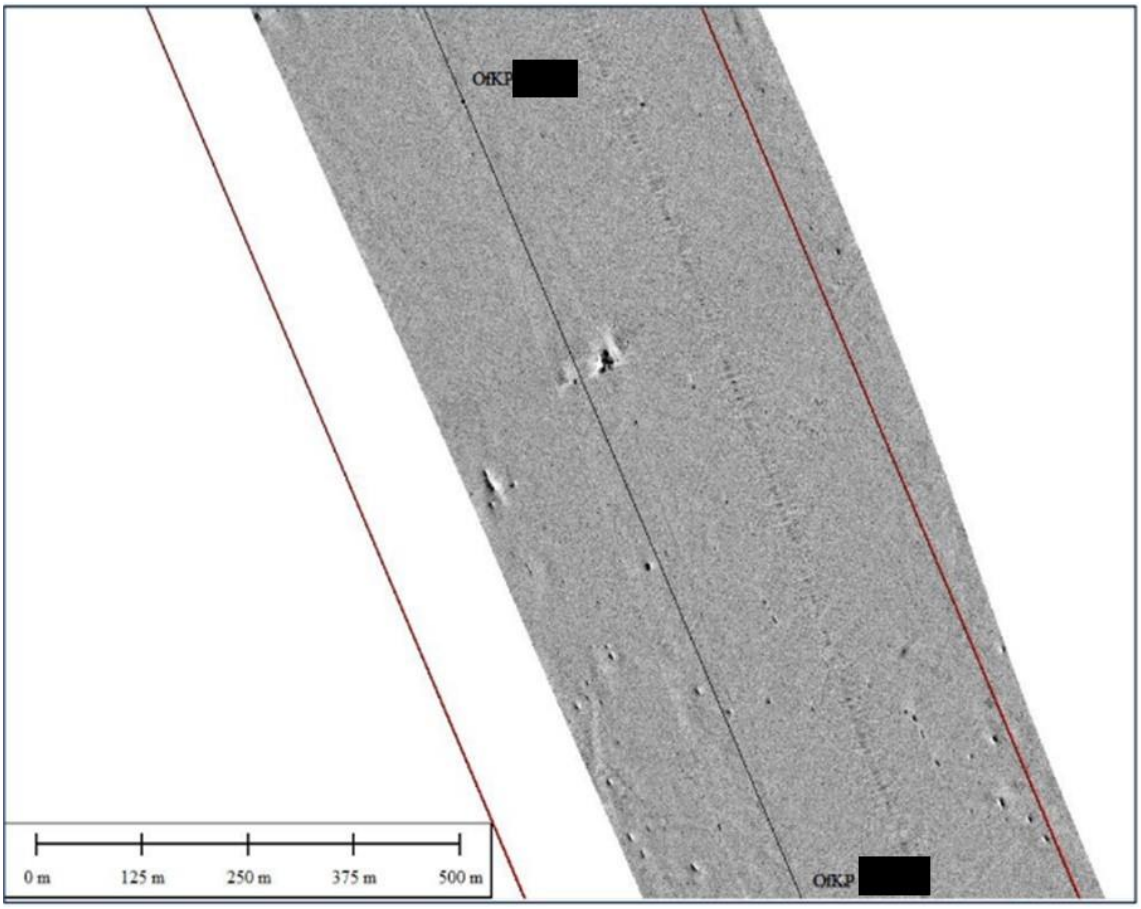

Figure 14: SSS rendering of the aircraft wreck (main target 2, a Junkers Ju 87)

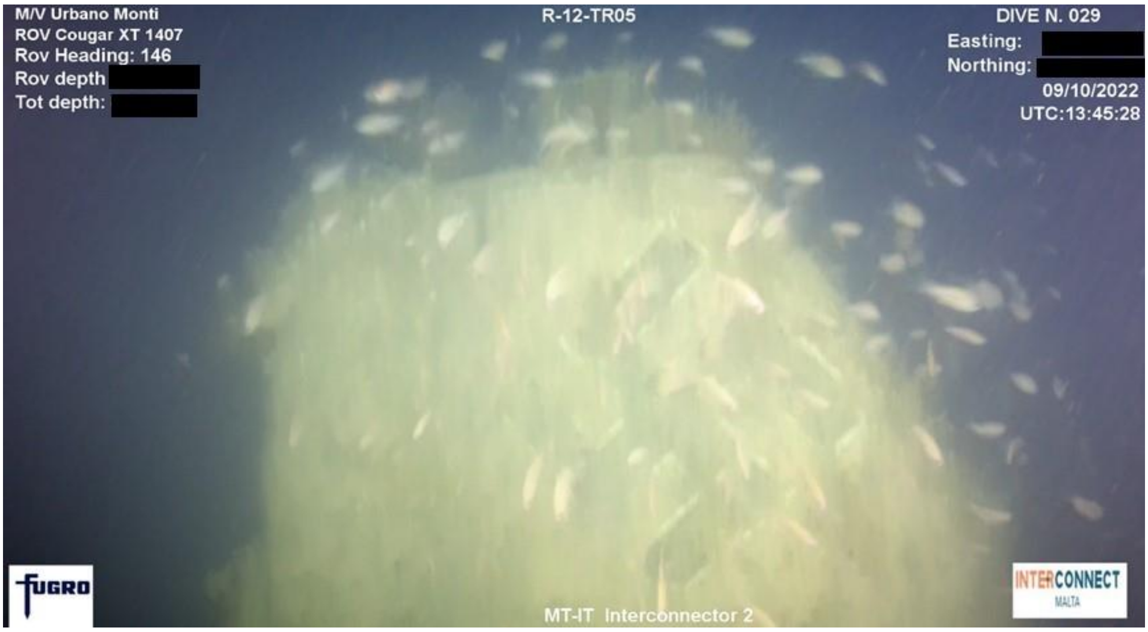

Figure 15: ROV photo of the aircraft's tail

FIGURE 16: CLOSEUP ROV PHOTO OF THE AIRCRAFT'S FUSELAGE

5.3.3 Main Target 3 – Unexploded UXO Cluster

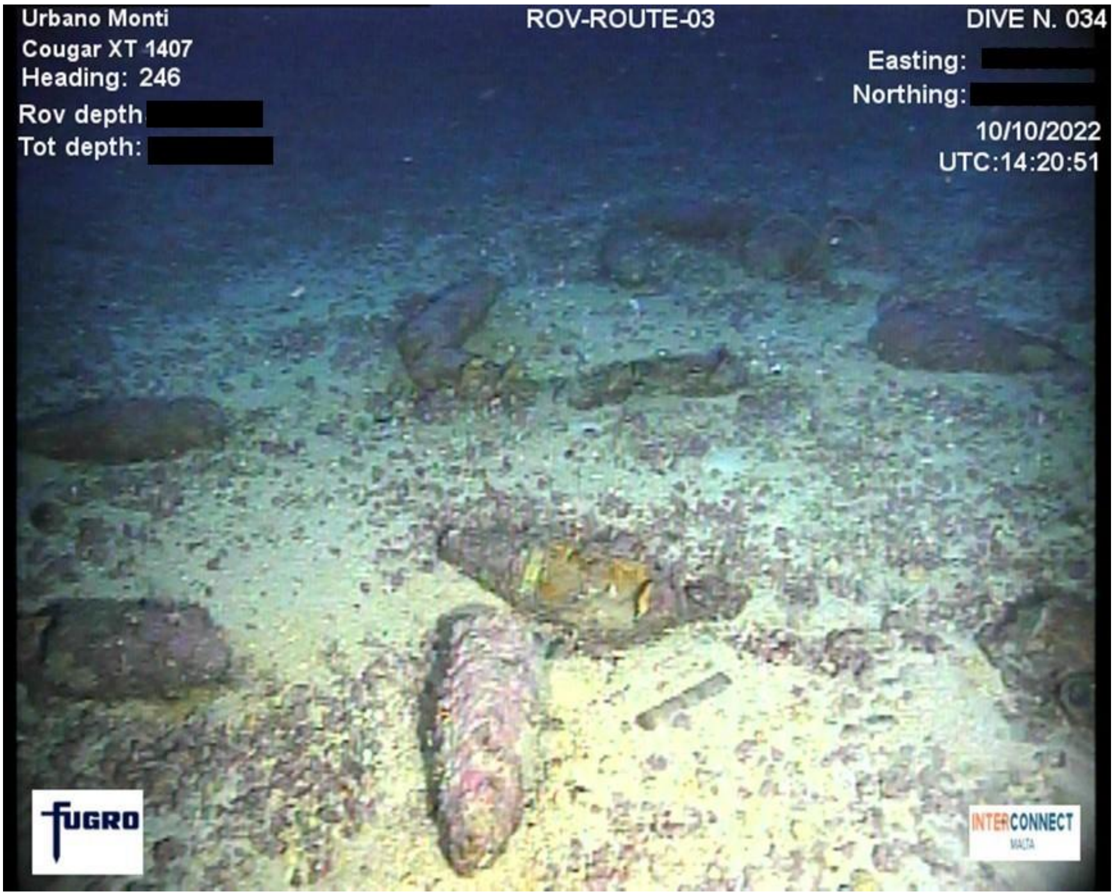

FIGURE 17: ROV PHOTO OF THE CLUSTER OF UXO

FIGURE 18: ROV PHOTO OF THE CLUSTER OF UXO

A significant quantity of debris from fishing (including weights, nets, and lines) and other marine activities, as well as construction and domestic refuse, were reported.

5.4 NEARSHORE SURVEY

The nearshore survey on the Maltese side did not reveal any features of potential archaeological interest.

5.5 ONSHORE SURVEY AND DISCOVERIES

Figure 50 shows the location of the listed archaeological sites within the AoI.

The buffer zone/AoI surrounding the onshore section of the interconnector encompasses three scheduled cultural heritage features, located at the southern end of the AoI, West to the Wasteserv main Entrance, namely three rock-cut tombs (CPL71, CPL72, and CPL73). Two of these tombs (CPL71 and CPL73) are cut into the sides of an ancient quarry. Just outside of the buffer zone lie two more quarries (CLP20 and CLP21), as well as a single dolmen (FHVL148). The northern end of the proposed area within the AoI 100m radius shown in Figure 51, West to the Maghtab landfill, is found within a rural landscape containing typical local rural vernacular features such as rural rooms (Figure 36), rubble walls, dry stone hut (Figure 49), as well as a possible farmhouse (Figure 33) next to the Mechanical treatment plant area. All of these features are located in private fenced areas, as visible in the following photographs.

The rubble walls located at the northern coastal zone (Figure 45, Figure 46, Figure 47), especially the ones closest to the planned interconnector route, are in a considerable state of disrepair (Figure 45) as discussed in Section 5.5.2 below.

FIGURE 19: ROAD NEXT TO ENEMALTA MAGHTAB TERMINAL STATION WITHIN THE ONSHORE AOI, LOOKING WEST

Figure 20: Enemalta Maghtab Terminal Station, looking North

Figure 21: Wasteserv Malta Entrance, looking North-West

FIGURE 22: WASTESERV MALTA ENTRANCE, LOOKING NORTH-WEST

FIGURE 23: WASTESERV MALTA INTERNAL ROAD WITHIN AOI, LOOKING NORTH-WEST

FIGURE 24: WASTESERV INTERNAL ROAD WITHIN AOI, LOOKING WEST

FIGURE 25: WASTESERV MALTA INTERNAL ROAD WITHIN AOI, LOOKING NORTH-WEST

FIGURE 26: WASTESERV INTERNAL ROAD WITHIN AOI, LOOKING NORTH-WEST

FIGURE 27: TRACK ASIDE THE QUARRY AND MODERN STABLE, LOOKING NORTH-WEST

FIGURE 28: TRACK ASIDE THE QUARRY WITHIN AOI, LOOKING NORTH-WEST

FIGURE 29: WESTERN GATE TO WASTESERV MALTA INTERNAL ROAD, LOOKING NORTH-WEST

FIGURE 30: WASTESERV INTERNAL ROAD TO MECHANICAL TREATMENT PLANT, LOOKING NORTH-WEST

FIGURE 31: WASTESERV MALTA OFFICES AND MECHANICAL TREATMENT PLANT, LOOKING NORTH

FIGURE 32: CAR PARK AND MECHANICAL TREATMENT PLANT, LOOKING NORTH

FIGURE 33: FARMHOUSE IN FRONT OF MECHANICAL TREATMENT PLANT AREA, LOOKING NORTH-WEST

FIGURE 34: WASTESERV MALTA INTERNAL ROAD WITHIN AOI, LOOKING NORTH-WEST

FIGURE 35: WASTESERV MALTA INTERNAL ROAD WITHIN AOI NEXT TO WASTE STORAGE TERRACE, LOOKING NORTH

Figure 36: Structure and rubble wall outside Wasteserv area, aerial photo

Figure 37: Rubble walls outside Wasteserv Malta area, looking North

Figure 38: Agricultural land West to Wasteserv Malta area, looking West

Figure 39: Agricultural land outside Wasteserv Malta, next to Mechanical Treatment Plant area, looking South

Figure 40: Agricultural land North-West to Wasteserv Malta area, looking North-West

Figure 41: Wasteserv Malta internal road within AoI next to waste storage terrace, looking North-East

Figure 42: Wasteserv Malta Internal road within AoI next to waste storage terrace, looking North-East

Figure 43: Wasteserv Malta internal track within AoI, looking North

Figure 44: Wasteserv Malta Internal track within AoI, looking North-East

Figure 45: Agricultural land West to Wasteserv Malta area, looking South

Figure 46: P1 Route Vertex area, looking North

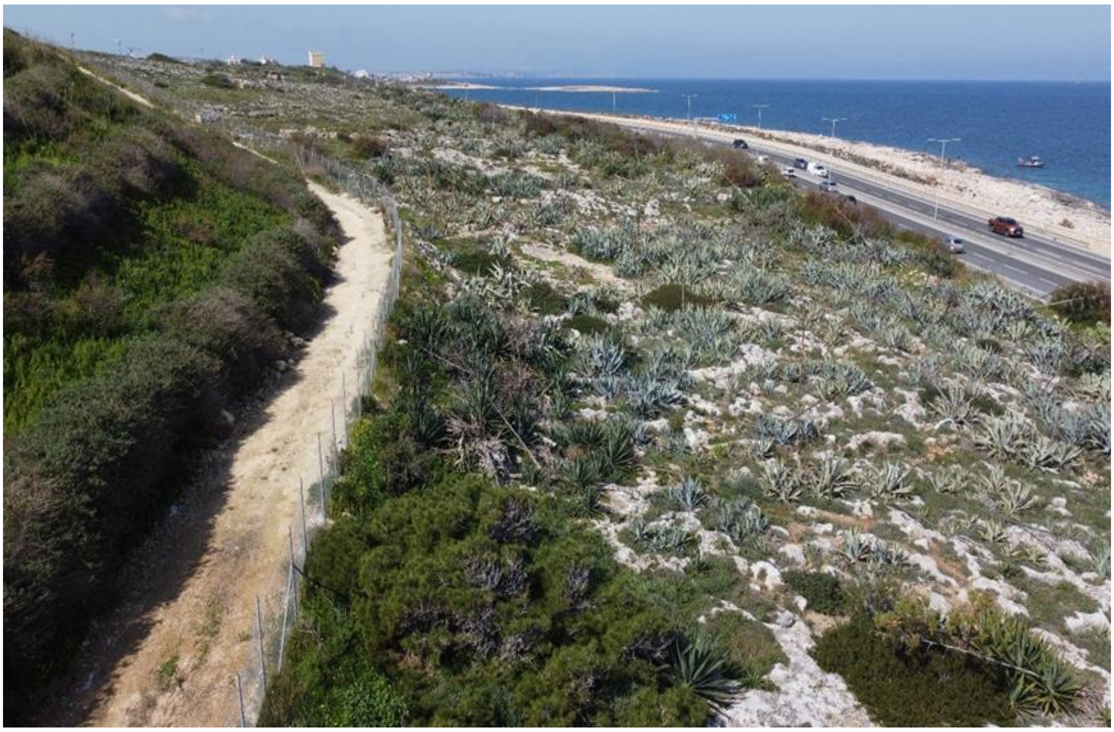

Figure 47: P1 Route Vertex Area looking West

Figure 48: Rubble wall with boundary marker, looking West

Figure 49: Rubble walls and dry stone hut, looking North-West

5.5.1 Cultural Material

No pottery or cultural material was noted during the landscape assessment at the location and surrounding areas.

5.5.2 Cultural Features

Figure 50 shows the location of the listed Archaeological sites within or in the proximity of the 100-meter buffer zone of the AoI, which are all located in the Southern part, whilst Figure 51 shows the location of the cultural heritage features identified during the site inspection, all located in the north-west part of the site. A different colour has been assigned to the rubble walls in order to represent their state of conservation (Fair or Poor), whilst the agricultural structures/buildings are in Moderate to Poor conditions (See Data Capture Sheets in Appendix I).

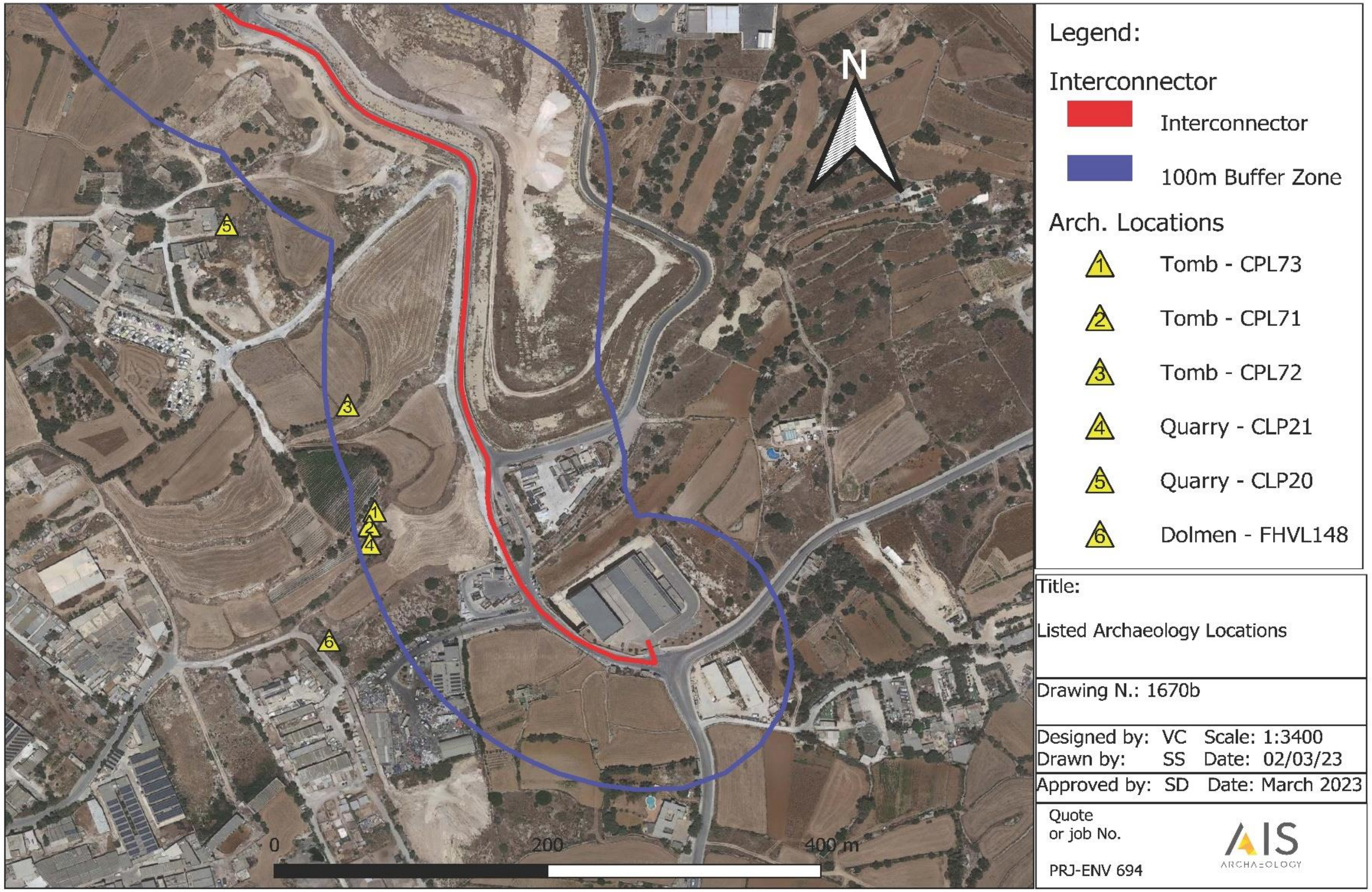

FIGURE 50: MAP SHOWING THE LOCATION OF THE LISTED ARCHAEOLOGICAL SITES WITHIN THE INTERCONNECTOR'S ONSHORE AREA OF INFLUENCE (100M BUFFER)

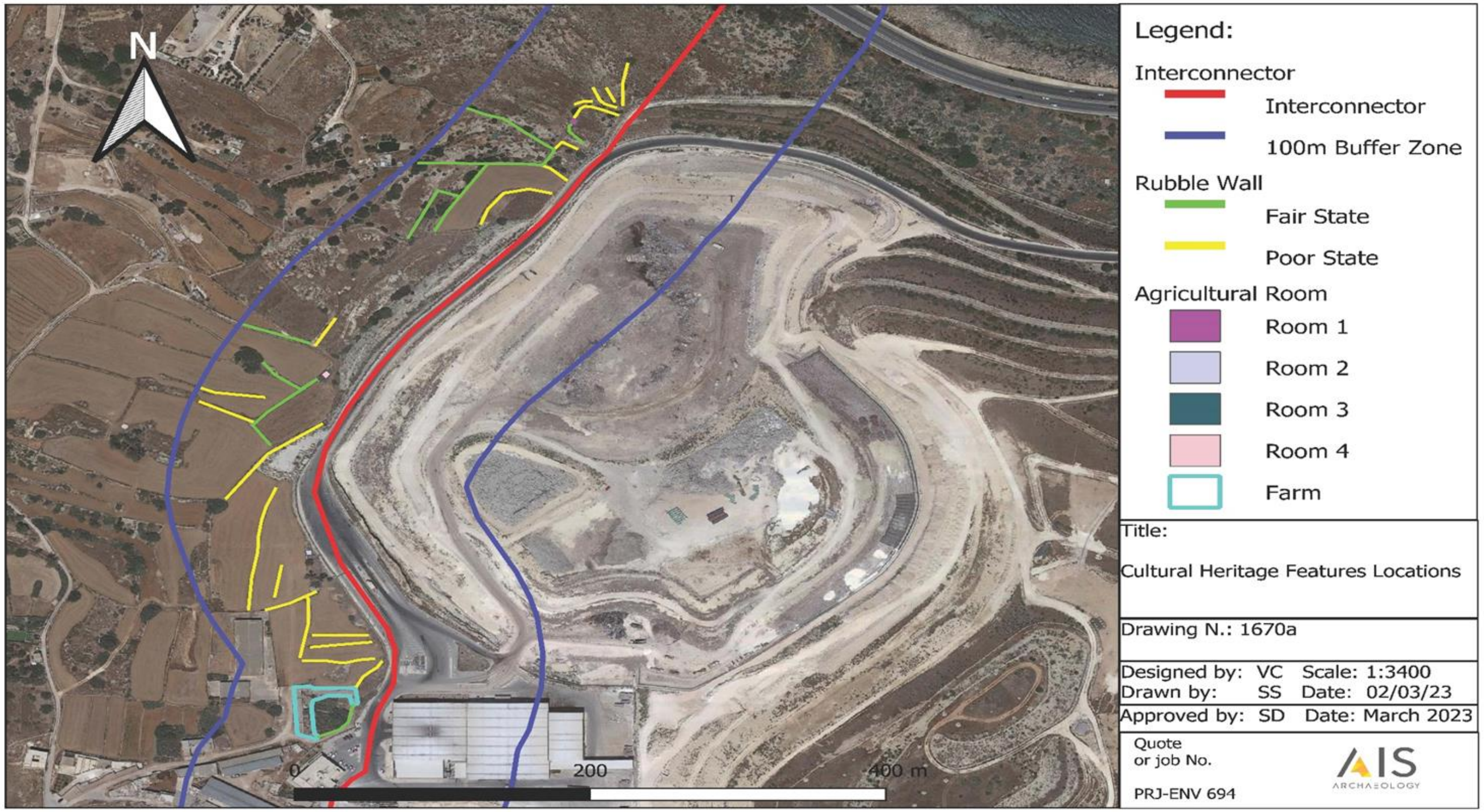

FIGURE 51: MAP SHOWING THE LOCATION AND STATE OF CULTURAL HERITAGE FEATURES WITHIN THE INTERCONNECTOR'S ONSHORE AREA OF INFLUENCE (100M BUFFER)

6 Impact Assessment

The Impact Assessment is required in order to determine any effects that the project may have on the identified cultural features and the surrounding landscape, and therefore the steps necessary to mitigate them.

With regard to the scheme however, the initial onshore section (approximately 250-300mm –Figure 2) proposed method involves Horizontal Directional Drilling (HDD). The drill is launched from the onshore end of the designed bore path and retrieved at the other end and, except for the launch and retrieving spaces above ground, the entire process takes place underground well below the surface. The cable is inserted into said tunnel and either pushed or pulled through. This ensures minimal ground surface disturbance and disruption, with the only real risk coming from possible subsidence. The possibility of buried material within the sediment column can also be considered in relation to the HDD methodology for installing the cable. While disturbance will occur underneath the surface, the laying of the cable will not affect the top surface layer.

With regards of the remaining onshore construction, the pipeline will be laid within an excavated trench of approximately 1.60m deep x 0.90m wide below the pre-existent asphalt surface (Figure 3).

The impact assessment takes into account the following known features within the 100m buffer zone (as shown in Figure 50 and Figure 51):

1. Listed Archaeological sites
2. Intact Rubble Walls
3. Rubble Walls in various poor state of conservation
4. Various Agricultural buildings/hut

The results of this study show that whilst the listed Archaeological sites and the rural landscape will not be impacted or altered by the proposed works, there will be a minimal indirect impact only on the rubble walls in poor state of conservation within the North-West 100m buffer zone. However, the possibility of underlying cultural remains at undisturbed levels underneath the pre-existent asphalt layer cannot be excluded.

7 Monitoring and mitigation Measures

Considering the limited impact given the depth and width of the trench necessary for the laying of the cables (approximately 1.60m x 0.90 m), it is recommended that an archaeological monitor be present during the trenching phase. It would be advisable, during the onshore works, to keep distance from contacts of cultural heritage interest at least of 50 meters to ensure their safety.

With regards the off-shore cable-laying, the operators responsible for implementation of these works have stated that any identified underwater features (wrecks and so forth) will be totally avoided via a “buffer zone”, as specified by Superintendence of Cultural Heritage, therefore by-passing said features by a considerable distance, thus avoiding/minimizing any impact or disturbance to same.

8 Summary of Impacts

Table 9: Summary of expected impacts on architectural, archaeological, historical and cultural heritage features

Impact type and source			Impact receptor		Effect & Scale							Probability of impact occurring (Inevitable/ Likely/ Unlikely / Remote/ Uncertain)	Overall impact significance	Proposed mitigation measures	Residual impact significance	Other requirements
Impact type	Specific intervention leading to impact	Project phase (construction/ operation/ decommissioning)	Receptor type	Sensitivity & resilience toward impact	Direct/ Indirect/ Cumulative	Beneficial/ Adverse	Severity	Physical/ geographic extent of impact	Short-/ Medium-/ Long-term	Temporary (indicate duration) / Permanent	Reversible (indicate ease of reversibility)/ Irreversible					
Onshore: Physical damage to cultural and/or archaeological features:	Excavation works	Construction	Cultural	Medium	Indirect	Adverse	Medium	Limited	Short term	Permanent	Irreversible	Remote	Not significant	Constant monitoring	Not significant	N/A
Offshore: Physical damage to cultural and/or archaeological features:	Laying works	Construction	Cultural	Medium	Indirect	Adverse	Medium	Limited	Short term	Permanent	Irreversible	Uncertain	Not significant	Clearance "buffer" area around documented offshore cultural features	N/A	N/A

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Appendix I

Rubble and Dry-stone walls 1/2

Cultural Heritage Data Capture Sheet			
Site Location Maghtab - Naxxar	**Category** Architecture	**Type** Rural	**Status** Poor to Fair
Eastings N/A	**Northings** N/A	**Feature** Rubble and Dry-Stone Walls	**Period** Unknown
Description **Rubble/Dry-stone walls and other retaining walls:** Rubble and other various retaining walls were/are field and/or property boundary walls, constructed primarly of irregular natural dry stones. Both of scheme site and Area of influence contained rubble walls. Some of these are buit with traditionally-sized rubble stones, whilst others have been clearly altered, added to or repaired with the intorduction of larger cut stones.			
Existining Legal Protection Legal Notice 160 of 1997		**Comments:** L.N. 160/97 prohibits the dismantling of such walls exept by petmition from the competent authority	

Site Map

Rubble and Dry-stone walls 2/2

Archaeological Characteristics

Conditions	Degree of Protection
Some abandoned, some partly collapsed, other repaired and rebuilt.	Legal Notice 160 of 1997 prohibits dismantling of such walls except by permission from the competent autority
State of Security	**Proposed Utilization**
N/A	N/A

Basic Bibliography

N/A

Compiled by:	Checked by:
Samuele Serini Date: 05/04/2023	Vincenzo Cherubini Date: 05/04/2023

Rural Building-Possible Farmhouse 1/2

Cultural Heritage Data Capture Sheet			
Site Location Maghtab - Naxxar	**Category** Architecture	**Property Function** Agricultural	**Porperrty Owner** Private
Eastings 14.435	**Northings** 35.946	**Feature** Farmhouse	**Period** Unknown
Description **Rural Building:** Two storey L-shaped structure, possibly farmhouse or agricultural activities.			
Scheduled by MEPA No		**Degree of Protection** N/A	
Site Map			

Rural Building-Possible Farmhouse 2/2

Archaeological Characteristics

Conditions	Degree of Protection
Delapidated State	N/A
State of Security	**Proposed Utilization**
N/A	N/A

Basic Bibliography
N/A

Compiled by:	Checked by:
Samuele Serini Date: 05/04/2023	Vincenzo Cherubini Date: 05/04/2023