PROJECT DESCRIPTION STATEMENT FOR THE SECOND ELECTRICAL INTERCONNECTOR BETWEEN MALTA AND SICILY

InterConnect Malta
September 2021

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

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Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

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1.0 Introduction

This document is being compiled by Interconnect Malta Co. Ltd. (the Applicant) being the organisation tasked with implementing the second electrical interconnector between Malta and Sicily.

This Project Description Statement is a detailed document requested by the Environmental Resources Authority (ERA) to provide the necessary information for screening in the Environmental Impact Assessment (EIA) process and is aimed to describe the project, the site of the development and its surroundings and planned activities during the construction and operational phases of the development. It also indicates the main expected environmental impacts.

Although the installation of a subsea and underground interconnection cable is not listed as a category for projects requiring an Environmental Impact Assessment in Schedule 1 of S.L. 549.46 given that the transmission system proposed will not be an overhead power line, the Applicant is following the precautionary principle and submitting this Project Description Statement. Consequently, this Project Description Statement (PDS) is being prepared in line with EIA Regulations (S.L. 549.46) in order for ERA to determine whether the project in question qualifies for the need of an Environmental Impact Assessment. Thus, this document is being prepared in line with Schedule II of the regulation.

1.1 Definitions and Abbreviations

a.c.	Alternating Current
d.c.	Direct Current
EU	European Union
IC1	Malta – Sicily Electrical Interconnector No.1 (Also known as 'MASI')
IC2	Malta – Sicily Electrical Interconnector No.2
ICM	Interconnect Malta Co. Ltd.
IEC	International Electro-Technical Commission
MECP	Ministry for the Environment, Climate Change and Planning
MESD	Ministry for Energy, Enterprise and Sustainable Development
MTG	Melita TransGas Co. Ltd.
MWe	MegaWatt electrical
S.L.	Subsidiary Legislation
SOP Mare	Soprintendenza del Mare
TERNA	Italian High Voltage Transmission System Operator
TM	Transport Malta

2.0 Details of the person/s wishing to carry out the development

The development has been submitted by Interconnect Malta Co. Ltd ("ICM") and declares itself to be the Proponent of this project. This organisation operates under the Ministry for Energy, Enterprise and Sustainable Development (MESD). The Proponent was established as Melita TransGas Co. Ltd (MTG) in August 2018 as a public undertaking wholly owned by the Government of Malta through Petromal Ltd. On 4th August 2021, the Proponent has changed its name to Interconnect Malta Ltd., ("ICM").

ICM (formerly MTG) is responsible to implement, construct, commission, operate and maintain the Melita TransGas Pipeline between Malta and Sicily and act as the prospective Maltese Transmission System Operator. More recently, has also been tasked with implementing the second electrical Interconnector, between Malta and Sicily.

3.0 Description of the Project and its General Objectives

Following the European Parliament elections in 2019, the European Union strengthened its policy towards limiting climate change caused by anthropogenic activities as detailed in the European Green Deal. Priority has now been shifted in achieving carbon emission neutrality by 2050. One of the consequences of such a policy is the decrease in the use of fossil fuels and increase in electrification of energy usage with regards the generation of electricity from renewable energy as well as the neutralisation of emissions from transport.

Recently, the decision was taken by the Maltese government to lay a second electrical interconnector (IC2) between Malta and Sicily in order to cater for the increased electrical demand expected to result from the forecasted economic progress as well as the electrification of road transport.

This will also be one of the strategies to enable Malta to reach its environmental targets towards achieving carbon neutrality by 2050.

- The main objective of the project is for Malta to import electrical energy through the European grid including energy sourced from renewables. Malta has been interconnected to the European electrical grid as from March 2015 through an underwater cable – first electrical interconnector (IC1) from Ragusa to Maghtab.

- The project aims to improve the security of energy supply by diversifying the energy sources given the economic growth is demanding more electrical energy from the grid.

- Contribute to the security of supply by strengthening the existing link with the European electrical network, thus enhancing the n-1 principle

- Improve economies of scale which are characteristic of European utilities operating much larger and more efficient plant than those locally installed.

- In view of the increasing renewable energy sources in Malta and Malta's commitments for RES penetration in the future, the interconnectors serve to enhance the stability of the grid by providing an alternating current link that will give more inertia to the grid and extra spinning reserve capacity to balance the intermittent fluctuations of renewables.

- Optimise the use of local generation plant.

- Reduce the environmental impact of locally installed electrical power plant in the light of the expected increase in electrical demand

- Contribute to ensure that Malta will comply with environmental and climate change obligations by importing electricity from sources emitting less or zero greenhouse gases than those installed locally. In fact, the European Commission is targeting that by 2030, the greenhouse gas emissions are to be cut by 40% from 1990 levels and the share of RES is to be at least 32% (Source: https://ec.europa.eu/clima/policies/strategies/2030_en).

- Facilitate the integration of any possible local offshore renewable electricity generating solar or wind farms by improving the connection to a large stable grid to offset their intermittency.

3.1 Technical Description of the Project.

The project shall consist of an underwater and onshore cable link between the Maghtab Terminal Station and the Ragusa 220kV substation in Sicily. The IC2 cable link shall have a nominal continuous rating capacity of 200MWe. It shall also be able to transmit approximately 70% overload for one hour (assuming previous operation at 90% load) in case of emergency without exceeding conductor temperature limits. Similar to IC1, the interconnector can operate in a bi-directional mode generally importing electricity from Sicily but being technically able to transmit electricity from Malta to Sicily should excess electricity produced in Malta from renewable sources be available in the future. The expected lifetime of the project is estimated at 40 years.

The terminal points of the project shall be the TERNA substation at Contrada Cimillà in Ragusa and the Maghtab terminal station at Qalet Marku area in Malta.

The interconnector cable shall be laid in public roads in Sicily and will avoid private properties. Trenchless shore approaches shall be adopted for both countries to minimise the impact on the shore at the landing areas. At this stage of the project a number of offshore route corridor options and also different Malta and Italy onshore route options are still being studied further to determine the best route.

The Applicant notes that the route alternatives provided are preliminary and the respective alignments are indicative and subject to potential improvement in step with the forthcoming assessments, studies and design. The offshore route will be surveyed along a 1.2km wide corridor which will serve as the area where the interconnector can be laid subject to design, bathymetry, cultural and environmental considerations. The area selected for the marine, geophysical and geotechnical surveys shall therefore provide a measure of flexibility vis-à-vis any other intermediary routes, hybrid/compromise alignments or other variations that may be necessary or desirable to address any emerging technical challenges, or environmental considerations, during the design and permitting stages.

More details regarding these are described in Section 7.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

4.0 An Indication of the Proposed Timing of the Project:

The current indicative project timelines are shown below:

Desktop Route Identification Study complete:	Q4 2021
Scoping Report submission to Italian Competent Authority:	Q4 2021
Scoping Report submission to Maltese Competent Authority:	Q4 2021
Issue of Screening Letter by Maltese Competent Authority:	Q1 2022
Issue of Parere by Italian Competent Authority:	Q1 2022
Preliminary Marine Route Survey Complete:	Q3 2022
Post Survey Assessments complete:	Q3 2022
Submission of EIA Malta:	Q1 2023
Submission of EIA Italy:	Q1 2023
Front End Engineering Design complete:	Q2 2023
Construction permit in Malta issued:	Q3 2023
Construction permit in Italy issued:	Q3 2023
Start of EPC Contract (inc. Procurement Phase)	Q3 2023
Start of IC2 Operation:	Q4 2025

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12 Triq Spiru Mizzi,
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e: info@icm.mt

5.0 The Location of the Project with site boundaries shown

The Malta side geographical location of the project lies in the north-eastern territory as shown in Figure 5.0.1.

Figure 5.0.1: Project Area Marked in Red

The site is situated at an elevation ranging between 0 and 14m. The approximate coordinates of the Malta end terminal point of the project (Maghtab Terminal Station) are 35° 56’ 20” N; 14° 26’ 32” E as shown in Figure 5.0.2. There is public access to the site from Triq ir-Ramla. However, access to within the terminal station itself is restricted to Enemalta p.l.c. authorised personnel only.

As can be seen from Section 7, the project shall either impact public roads or areas owned by MECP, that is, government owned properties.

Figure 5.0.2: Terminal Site Location Marked in Red

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

6.0 Alternative uses, technologies and locations for the project.

6.1 Alternative Technologies

The project is required to supply and satisfy the increased electrical energy requirements of the Maltese nation. The alternative technology solutions available are as follows:

6.1.1 Additional fuel fired electricity generation plant

An additional electricity generating plant would be required to meet the projected increase in energy demand. In fact, this increase in demand is clearly demonstrated in the Malta's 2030 National Energy and Climate Plan and shown in Figure 6.1.1. Such plant would have to be hydrogen ready in order to comply with the reduced greenhouse emission limits required in order to meet the EU Green Deal policy. At this stage (2021) such technology is not mature enough and therefore would be a risky proposition as this technology is expected to evolve rapidly in the medium term and there would be the potential risk that early plants could result in stranded assets. Moreover, the addition of more local generation would need additional investment in the source of fuel potentially through a hydrogen ready gas pipeline and the availability of hydrogen through the European gas grid.

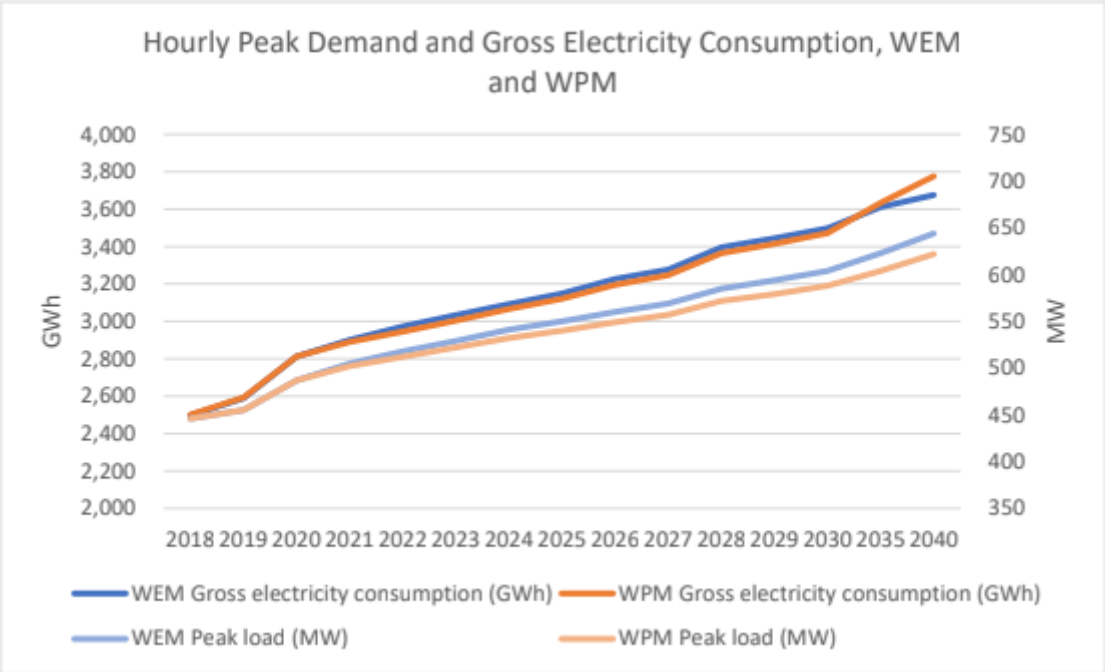

Figure 6.1.1: Peak load (MW) and gross electricity consumption (GWh) under WPM (with planned measures scenario) and WEM (with existing measures scenario), 2018-2040 (Source: Malta's 2030 NECP, December 2019).

6.1.2 Additional renewable energy generation plant

Another solution would be the accelerated installation of renewable electricity generating plant. These would meet the green deal objectives as regards climate change issues. However, they suffer

from energy output intermittency, and they still need that additional supply, either through local generation or by an interconnection, is made available to balance this intermittency. Should such balancing not be available, energy storage systems would be required to match their output with the electricity demand characteristics of the Maltese consumer. Such systems will increase further the cost of RESs and its implementation will take much longer than a more conventional source of energy. Battery energy storage systems could be distributed or centralised and it is likely that there will be a mix, and their overall spatial requirements, control and dispatch is challenging. Renewables will need a larger area as compared to conventional generation plants or interconnections. As such an area is not available onshore in Malta, offshore solutions will have to be resorted to. Such infrastructure will result in increased capital cost.

It is pertinent to note that renewables are not direct competitors of the interconnection cable, but both solutions are complementary, and one will not exclude the other. On the contrary an a.c. interconnection will give the necessary spinning capacity for more renewables to be installed over a longer period of time to cater for intermittency.

6.1.3 D.C. Cable links

Another alternative to the technology chosen is to link the Maltese and European networks using a d.c. link. Although operationally versatile, such a link results in increased area at both ends to house the converters necessary for the operation. This will also increase the capital cost and maintenance complexities and decrease reliability although in the long run operation is more efficient. When considering island systems, such as the Maltese case, and the impact of a sudden loss in local generating plant due to a fault, a DC connection will not provide the convenient backup capability unless the convertors are sufficiently oversized. This means that the cost of convertors will be even higher, implying that they would be uncompetitive, compared to a 50Hz solution. Another feature that some consider to be advantageous when implementing a DC solution is that it effectively isolates the Maltese grid from the transients occurring on the Sicilian or southern Italian grid. The counterargument is that the fault contribution from the European grid is useful to ensure that the protection systems in Malta operate notwithstanding the ever-increasing percentage of inverter driven RESs. Furthermore, basing on the experience of IC1, the effects of transient voltages and faults on the Sicilian system have very rarely been detrimental to the performance of the Maltese grid and to the supply to its consumers.

6.2 Alternative Locations

Sites considered for the location of the project were rated using the following criteria.

1. Site shall have access to the eastern coast of Malta so as to minimise shore approach costs. Coastline to the west of Malta features combination of deep waters and high elevations/ cliff faces.

2. Site shall already be equipped with electrical infrastructure to accommodate the imported power from IC2 and will have infrastructural connections to the Maltese 132kV network.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

3. Site to be situated away from populated areas in order to minimise social impacts and inconvenience (noise, dust, access to site, public safety) that would arise during the installation of the project.

4. Site to be distant from touristic areas to minimise impacts with this type of industry

5. Site to be accessed by road network due to minimise the disturbance to any other users during the construction phase, and preferably the site should be situated in a zone already committed for industrial purposes.

Two sites in Malta fit these criteria. These are Delimara Power Station and Maghtab terminal station.

The Delimara Power Station site was dropped from consideration due to the following technical issues:

- The site is earmarked for the landing point of the Hydrogen ready Melita TransGas Pipeline from Sicily. Therefore, landing IC2 on this site would have added a layer of complexity to this national project.

- Delimara Power Station already the location for generating plant providing 630MWe. Adding another 200MWe power at this site and leaving the Maghtab terminal station importing only 200MWe would have reduced the benefit of the project from the point of view of security of supply in case of any unwarranted event in the Delimara Power Station. Therefore, connecting the project at Maghtab would lead to a more reliable system as the energy inputs to the Maltese grid between these two sites would be further equalised.

- Connecting IC2 to Delimara Power Station would also have meant an increase in cost of the project due to the extra submarine cable length and related physical protection measures that would be required due to the dense marine traffic in the Grand Harbour- Marsaxlokk Port zones which would also result in an increased hazard to the unprotected cable on the sea floor.

- Since Qalet Marku exhibits a gentler slope with respect to Delimara peninsula, it would reduce the need for possible pre-and post-trenching near the Delimara peninsula due to the rocky sea floor and its depth.

- The terminal station at Maghtab is already equipped with most of the civil works needed to install the second interconnector, namely the HV switchgear room, cable ducts at basement level of the Terminal Station, a transformer bay and shunt reactor's bay as well as the cable tunnels to connect this station to the local electricity grid. For this IC2 project, the onshore civil works needed would be composed of the trenchless shore approach, the cable trench and minor modifications within the existing building to improve cable laying.

Therefore, terminating this project at Maghtab Terminal Station would be the optimal solution and a natural consequence of the generation planning process implemented in the last years.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

7.0 A Description of its Physical Characteristics

7.1 Size, Scale and Design of the Project.

The project shall comply with the IEC (International Electro-Technical Commission), CENELEC and other European and International technical standards as well as Italian and Maltese regulations during the design, construction and testing phases of the project.

The project shall consist of a synchronised electrical link between the Maltese and Italian electrical networks. The project shall connect the TERNA 220kV substation sited in Contrada Cimillà at Ragusa, Sicily to the Maghtab terminal station at Qalet Marku. The connection and transmission voltages to Malta shall be at 220kV with transformation in Malta to match the local 132kV network in Malta. The technical considerations shall be such that the two interconnectors shall operate in parallel in an unrestricted manner in order to achieve the maximum benefits of the project.

The cable link shall be rated at 245kV and shall be designed to operate in parallel with the existing link in order to maximise the power transfer between the two networks as shown by Figure 7.1.1 below. With the exception of equipment which shall be installed at both the Ragusa as well as the Maghtab stations, the project shall develop underground or underwater. No permanent constructions above ground shall take place in Malta.

Exiting from the proposed trenchless approaches, the offshore cable shall be protected using cast iron shells nearshore both countries and in sandy or clayey type seafloors shall be buried. In areas where the seafloor is rocky, the offshore cable shall be protected using a combination of rock placement, and concrete mattresses. These techniques shall also be adopted to avoid free spans and for offshore infrastructure crossings.

Thrust boring, trenchless or HDD techniques shall be adopted for onshore crossings in Sicily where the service that uses such infrastructure crossed cannot be interrupted (e.g. railways, major highways).

The overall electrical single line diagram related to the interconnector project is shown in figure 7.1.2. The items shown in black already exist, the ones shown in red are earmarked for this (IC2) project while the items shown in green are planned for future expansion.

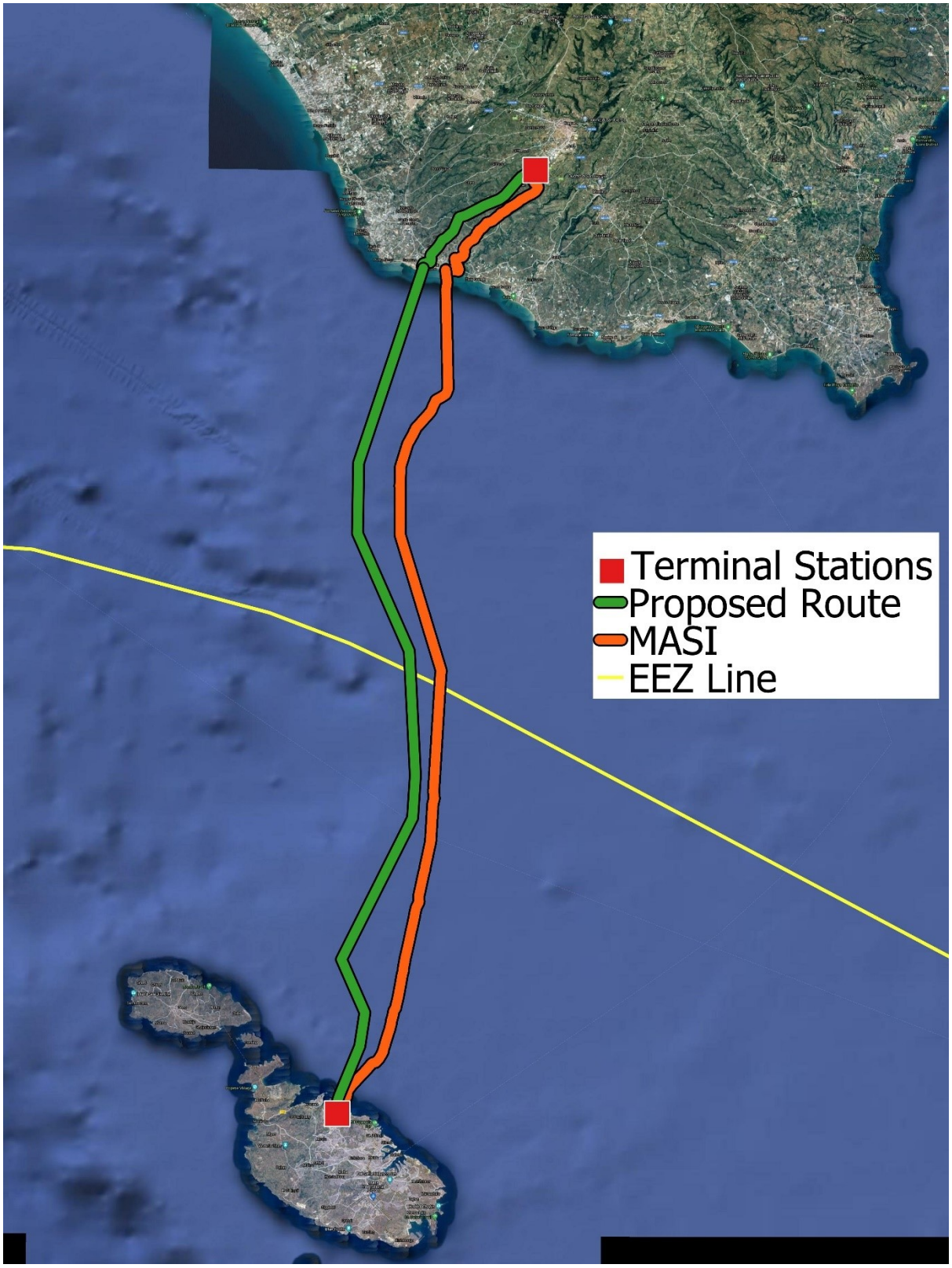

Figure 7.1.1.: Overall Generic Route showing Existing Cable (Orange), Existing Terminal Stations (Red) and one of the proposed alternatives (Green).

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

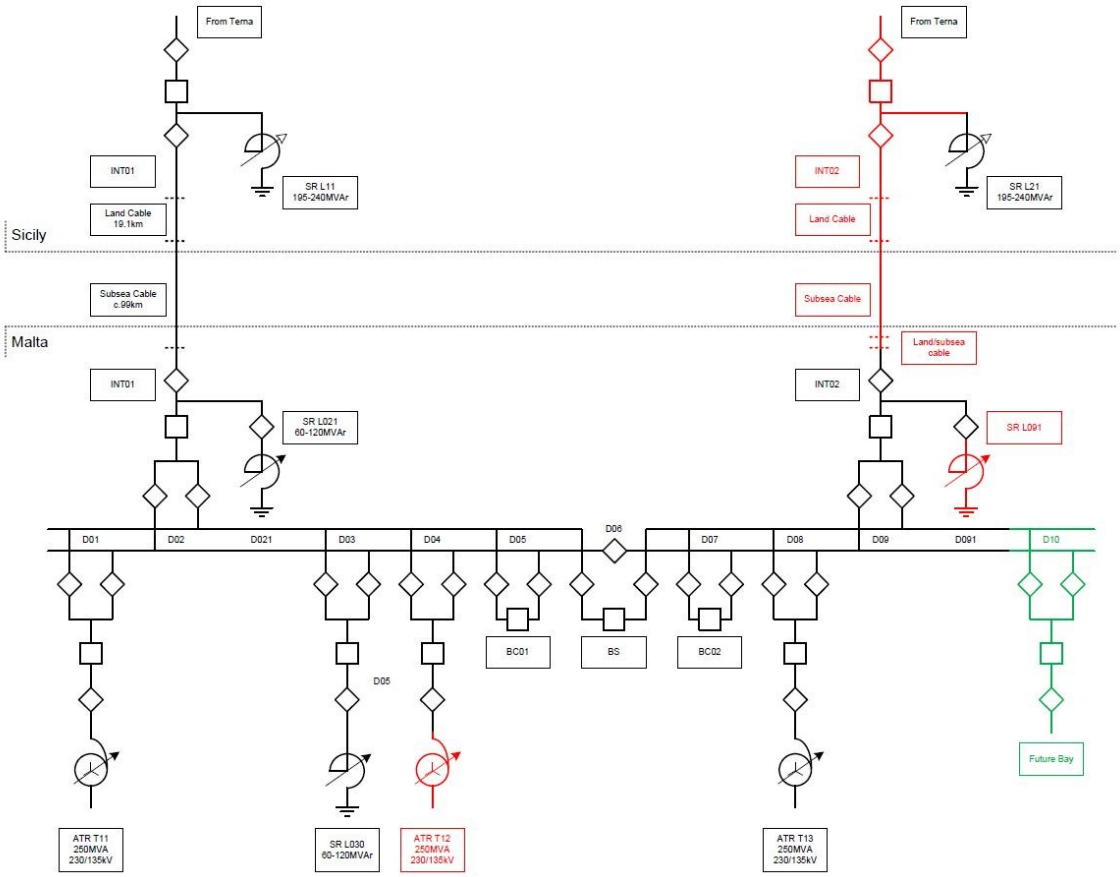

Figure 7.1.2 Overall Single Line Diagram- In Red, infrastructure to be installed during this phase of this project

7.2 Characteristics

The choice of the actual offshore route and the matching onshore route in Malta shall be taken at a later stage when the route identification study shall be completed by technical consultants. However, a preliminary analysis of alternative offshore corridors and possible onshore routes was already carried out and is being annexed to this document, Annex 1 - Preliminary Route Identification Report Second Malta – Italy electrical interconnector. The document's purpose is to restrict the alternatives to the feasible options. The final route chosen will be determined following the completion of the design (FEED) and permitting studies.

7.2.1 Onshore Sicily

The onshore cable route in Sicily shall be buried and where possible shall follow public roads between the TERNA substation in Ragusa and the Sicilian shoreline and will avoid private properties as much as possible. The land cable shall mostly be buried in a trench and the onshore Sicilian route shall comply with the various safety legislative decrees and technical standards as applicable on the Italian territory. The land cable shall terminate in a transition joint at the submarine cable landing point. A trenchless approach shall be availed of in Sicily to eliminate the visual impact of the project and mitigate environmental impact. The proposed onshore routes in Sicily are shown in Figure 7.2.1.1.

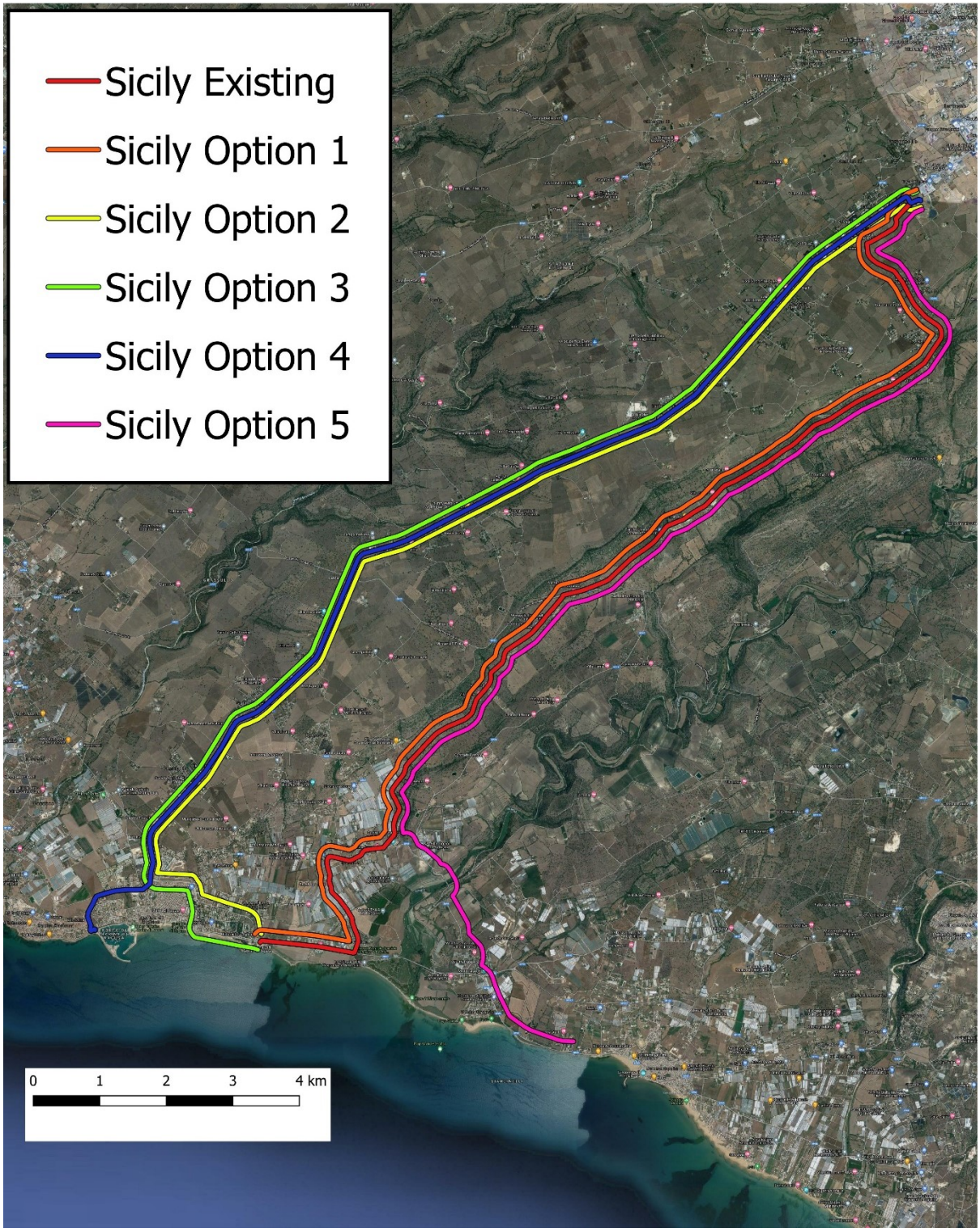

Figure 7.2.1.1 Proposed Interconnector 2 Onshore Routes in Sicily

Five alternative onshore routes are being proposed onshore Sicily with one route (option 1 in figure 7.2.1.1) following the same roads as the original interconnector, three other proposed routes (Options 2, 3 and 4 in figure 7.2.1.1) following completely different roads and option 5 shall partly use the existing IC1 route and continue along another road till the shoreline. Three different shore approach sites are being proposed. The original one for route options 1, 2 and 3 which is sited near the Luna Park on the east side of Marina di Ragusa while other two approach sites are proposed for option 4

(west of the Porto di Marina di Ragusa) and 5 (between Playa Grande and Donnalucata) respectively. The lengths of the alternative proposed onshore routes in Sicily are shown in table 7.2.1.1.

Sicily onshore route option number	Onshore route length Sicily (km)
1- Red Route	18.9
2- Yellow Route	18.4
3 – Green Route	18.6
4 – Blue Route	17.9
5 – Pink Route	20.1

Table 7.2.1.1 Length of onshore route options in Sicily

The final onshore route in Sicily shall be chosen taking care of the following criteria:

- Ideally choose a different route than IC1 to ensure that the effect of an action on one cable circuit does not affect the other (e.g. construction activities)
- Maximize the feasibility and acceptability from an environmental and legal perspective of the landing areas
- Avoid as much as physically possible known cultural heritage sites (cemeteries, archaeological sites, wrecks etc.)
- Avoid as much as physically possible agricultural zones including wells or other underground features
- Minimise the interference with Natura 2000 sites and Important Bird Areas
- Avoid interference with sites of ecological importance
- Minimise interference with presence of critical infrastructure (water and gas pipelines, cables, overhead lines etc.)
- Minimise the interference with touristic areas
- Minimise the interference with restricted zones (hydrocarbon exploration and exploitation, military zones etc.)
- Minimise the interference with any interdicted zones
- Avoid geological hazards and documented areas containing geological hazards including faults
- Avoid river buffer areas
- Minimise the interference with crossings of bridges, roads, railways, underpasses etc.
- Minimise the social impact to residents
- Areas subject to development permits or expropriations
- Contaminated areas
- Onshore waste dumping sites
- Minimise the interference with military zones
- Avoid high traffic routes as much as possible
- Choose the route which lessens the difference in cable length between IC1 and IC1

7.2.2 Offshore Route Proposals

From the shore approach in Sicily, the cable shall start on its offshore route towards Malta avoiding natural and man-made obstacles and taking into consideration various factors including:

- Maximising the separation distance between IC1 and IC2 to ensure that a detrimental action affecting one submarine cable does not affect the other (e.g. dragging of anchors and trawling equipment, seaquakes, etc.)
- Whenever possible avoid offshore crossings with IC1
- Where possible, minimise interference with underwater cultural heritage sites (archaeological sites, wrecks, etc.) with at least a buffer of 800m
- Avoiding or if not possible, minimising the interference with posidonia oceanica meadows, Natura 2000 sites and Important Bird Areas
- Avoiding or if not possible minimising the interference with SOP Mare and TM sensitive areas
- Avoiding or if not possible minimising the interference with aquaculture zones
- Avoiding or if not possible minimising the interference with vessel bunkering areas
- Avoid declared anchoring zones and officially recognised anchoring plateaux
- Avoiding or if not possible minimising the interference with official fishing and trawling areas
- Avoiding or if not possible minimising the interference with sites of ecological importance
- Avoiding or if not possible minimising the interference with presence of critical infrastructure (pipelines, cables, etc.)
- Avoiding or if not possible minimising the interference with touristic areas
- Avoiding or if not possible minimising the interference with restricted zones (hydrocarbon exploration and exploitation, military zones etc.)
- Minimise the interference with any interdicted zones
- Avoid geological hazards and documented areas containing geological hazards including faults and soil liquefaction zones
- Avoid offshore waste dumping sites
- Choose the shortest route possible

Protection shall be afforded to the offshore cable through burial (in sandy or clayey stretches) or where this is not possible due to the seabed formation, by protecting it with rock berms (rock placement) or using polyurethane shells at crossings. Nearshore, at the offshore outlet of the trenchless approaches, the cable shall be protected by enclosing it with articulated cast iron shells (particularly in posidonia oceanica meadows) and burying it wherever possible.

In order to avoid common mode faults, it is planned that, except for nearshore areas, IC2 shall follow a different route from IC1 at a distance of about 4km wherever possible. Three different alternative offshore routes are considered for IC2 (See Figure 7.2.2.1) as described below:

Offshore Route Proposal 1 (East Offshore Alternative): This proposed route lies to the east of the current interconnector. It exits the Malta shoreline towards the north-east and approximately 10 km from the Maltese shore turns towards the north. This proposed route will continue in such a direction until the Maltese continental shelf and enters the Italian EEZ and continues towards the Sicily

shoreline until it reaches the proposed landing point between Lungomare di Donnalucata and Playa Grande to the East of the landing zone for IC1. This proposed route corridor generally lies between 5km to 17km to the east of IC1. This corridor would match Malta onshore route options 4 and 5 (Explained in the next section). The estimated underwater length of this route corridor proposal is 99.9km.

Offshore Route Proposal 2 (Proposed Offshore Alternative): This route proposal exits Qalet Marku area towards the north for about 9.5 km avoiding bunkering Area 1 and trawling zone D. Then it changes direction towards the northwest and then turning northeast parallel with Melita 1 cable passing to the east of trawling zone I and passing through a hydrocarbon prospective area. To the north of this trawling zone, it changes direction towards the northwest staying approximately at a 4 km distance from IC1 until it reaches the Sicilian shoreline at the proposed landing point just to the west of the Porto Turistico di Marina di Ragusa. This corridor would match Malta onshore route options 1, 2 and 3 (Explained in the next section). The estimated underwater length of this route corridor proposal is 97.4km.

Offshore Route Proposal 3 (West Offshore Alternative): This route proposal exits Qalet Marku area and follows the same route as Route Proposal 2 but still south of trawling area I, continues towards the north west and moves parallel to the north- western border of this trawling area until it intersects with Route Proposal 2 approx. 8km south of the Malta continental shelf line and then follows the same path as Route Proposal 2 until it reaches the Sicilian shoreline again at the proposed landing point just to the west of the Porto Turistico at Marina di Ragusa. This corridor would match Malta onshore route options 1, 2 and 3 (explained in the next section), yet its proximity to the end of the Malta-Sicily channel makes it a very risky corridor to choose for further studying (See Figure 7.2.2.2). The estimated underwater length of this route corridor proposal is 101.5km.

The EIA of the first interconnector reported the following geological features along the offshore route:

- From 0 to 11 km from Malta coast, there is the presence of rocks and rock subcrops with an escarpment which lies between 5 and 7.9 km from the shoreline
- From 11 to 65 km from the Malta coast, the seabed is smooth consisting of sandy clay and silty fine sand. Pockmarks are present but these are not large.
- From 65 km to Sicily landfall, seabed is made from sediments composed of silty clay and very fine silty sands. No rock outcrops or subcrops are found in this area

There are also a number of communication cables that will have to be crossed. It has recently been reported that a new communication linking France to Egypt and passing through Malta has been planned and is to be laid in the near future.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

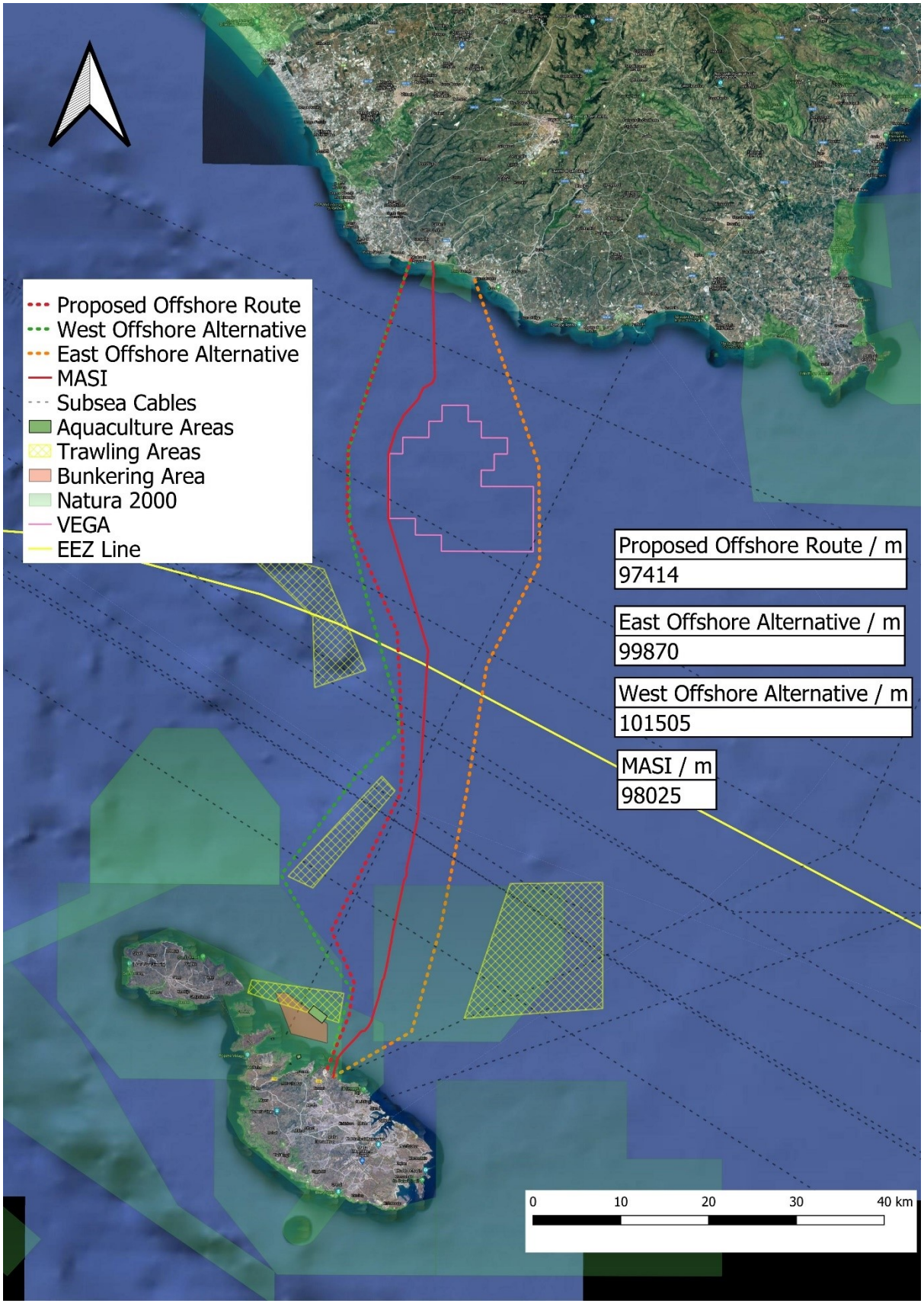

Figure 7.2.2.1: Offshore Route Proposals for the 2nd electrical interconnector Malta – Sicily

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

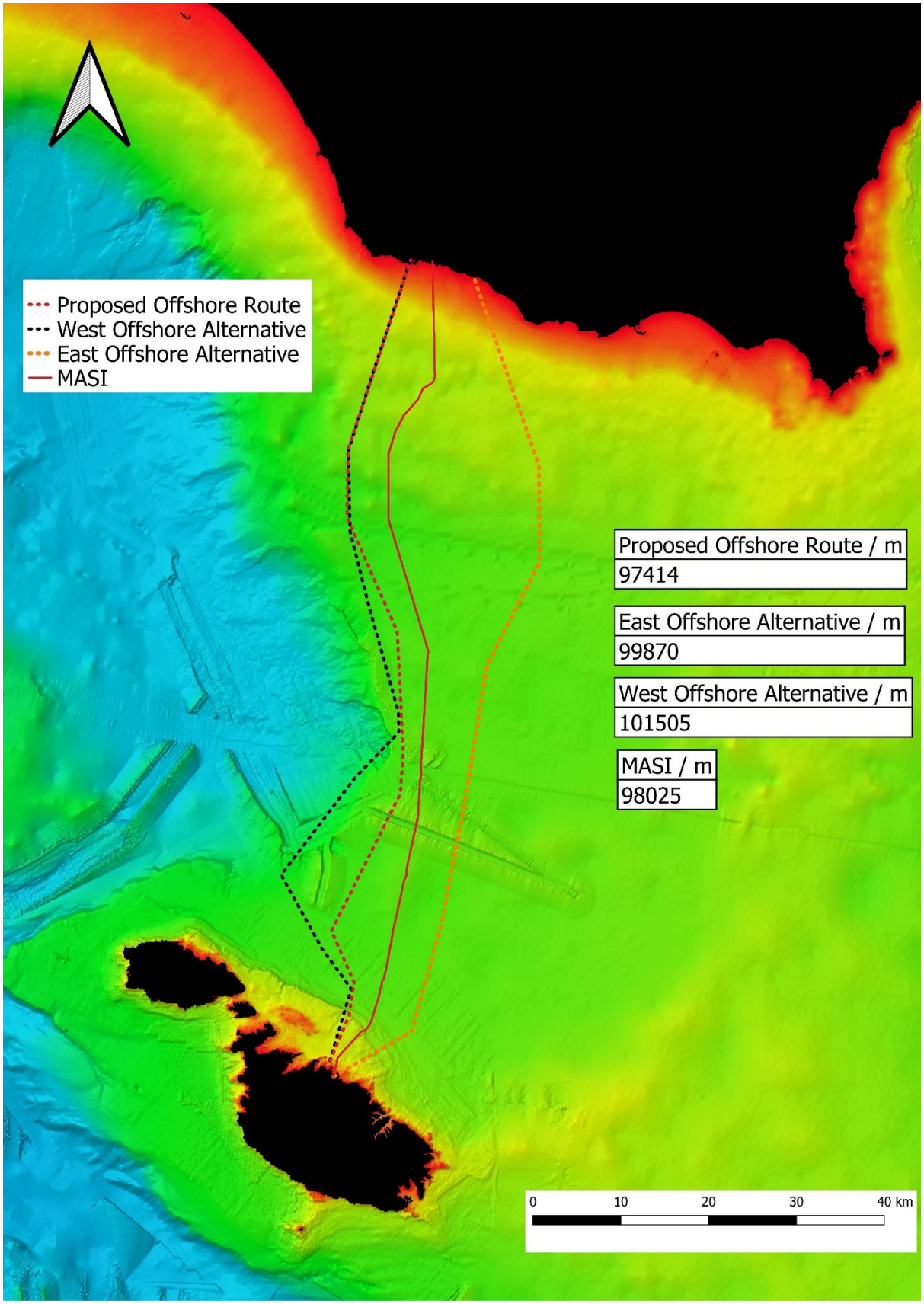

Figure 7.2.2.2: Offshore Route Proposals overlayed on maps showing bathymetry of the Malta-Sicily Channel. From Red to Blue increasing in depth.

7.2.3 Alternative onshore routes in Malta

The 220kV cable to Sicily shall exit the Maghtab terminal station and be laid in an underground trench or culvert towards the shoreline at Qalet Marku. **All shore approaches (land-sea transitions) shall be carried out through trenchless methods, either Horizontal Directional Drilling or Micro-Tunnelling depending on the results of the analysis of the geotechnical samples taken on site.** The purpose of using such technology is to avoid a permanent visual impact, mitigate environmental damage and also simplify the transition from land to sea and to safeguard the coastal areas from interferences that would otherwise be caused if a coffer-dam type approach had to be constructed.

The onshore route in Malta shall be subject to minimum or no interference with the following criteria:

- Maximise the separation distance between IC1 and IC2
- Whenever possible choose an onshore route that avoids offshore crossings with IC1
- Avoid or if not possible, minimise the interference with Natura 2000 sites and Important bird areas
- Avoid or if not possible, minimise the interference with TM sensitive areas
- Avoid or if not possible, minimise the interference with Sites of Ecological importance
- Minimise the interference with presence of critical infrastructure (pipelines, cables, etc.)
- Avoid or if not possible, minimise the interference with touristic areas
- Avoid or if not possible, minimise the interference with restricted zones
- Avoid or if not possible, minimise the interference with any interdicted zones
- Avoid geological hazards and documented areas containing geological hazards including faults and soil liquefaction zones.
- Avoid or if not possible, minimise the interference with military zones

Five alternative underground routes onshore Malta are being proposed (See Figure 7.2.3.1): –

- Option 1 – Exit from the Maghtab terminal station, passing within the Wasteserv Maghtab complex and exiting on the western side of the Natura 2000 site L-Ghadira s-Safra MT0000008 outside of Qalet Marku bay. Underwater cable shall then be laid towards the north towards Sicily. Qalet Marku Bay shall not be impacted using this option.

- Option 2 – Exit from the Maghtab terminal station passing within the Wasteserv Maghtab complex and exiting 375 m to the southeast of Natura 2000 site L-Ghadira s-Safra MT0000008, exiting towards the northeast and proceeding north towards Sicily. This option shall not impact the Qalet Marku bay

- Option 3 – Exit from Maghtab terminal station and passing along Triq ir-Ramla on the other side of the road from IC1 with shore approach within Qalet Marku bay. The cable makes an underground crossing beneath IC1 in the vicinity of the T-junction between Triq ir-Ramla and Triq Tul il-Kosta and proceeding through the trenchless approach towards the north.

- Option 4 – Exit from Maghtab terminal station and passing along Triq ir-Ramla on the other side of the road from IC1 with shore approach within Qalet Marku bay. The cable then

proceeds beneath Triq il-Kosta exiting the shoreline on the eastern side of IC1 and proceeds towards the north.

- Option 5 – Exit from the Maghtab terminal station passing within the Wasteserv Maghtab complex and exiting 175 m to the southeast of Natura 2000 site L-Ghadira s-Safra MT0000008, exiting towards the northeast, the trenchless approach passing below IC1 and proceeding north towards Sicily. This option shall not impact the Qalet Marku bay.

Characteristics of these 5 Malta onshore options are shown in table 1:

Table 1: Malta onshore route characteristics:

Option number	Onshore route length (m)	Trenchless Shore approach length (m)	Offshore route length to Reference line at the top of *Figure 7.2.3*.1 (m)	Total route length to Reference line at the top of *Figure 7.2.3*.1 (m)	Route position referred to IC1
1	2000	200	300	2500	West
2	1400	200	800	2400	West
3	800	600	700	2100	West
4	850	200	1250	2300	East
5	1750	450	500	2700	East

Figure 7.2.3.1 displays two yellow lines that indicate the planned position of the two cooling water pipes that pertain to the Wasteserv waste to energy project under PA3012/20. At the time of writing of this document, the permit for this development has not been issued and these two lines have been inserted in figure 7.2.3.1 for illustrative purposes given that this is still a pending proposal and subject to permitting decisions. See section 8.0 for further details.

Further details for the alternatives being proposed can be found in the annexed document - Preliminary Route Identification Report Second Malta – Italy electrical interconnector.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

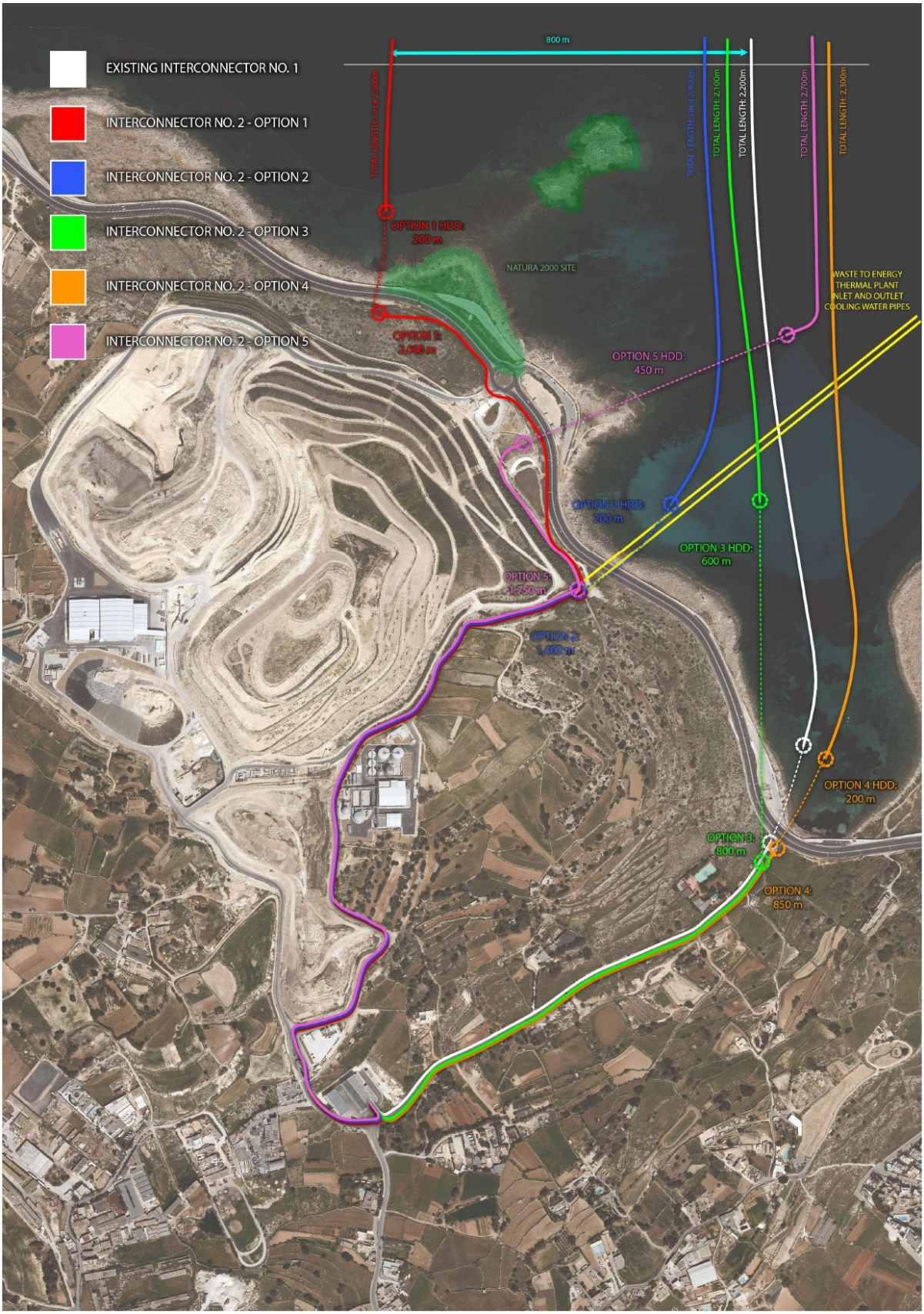

Figure 7.2.3.1 Malta Onshore Route options for the 2nd electrical interconnector

7.2.4 Technology adopted

The technology being adopted for IC2 shall be the same as that used for IC1. This shall use a high voltage (220kV) a.c. synchronised link. This technology has the following favourable features.

- High power synchronous connection with a significant overload capability: The performance of the Maltese electrical network has benefitted from the synchronous connection to the ENTSO-E grid in Italy. The frequency in Malta has become more stable, and loss of local generation or significant variations in RES outputs have been covered by a flexible power source, sometimes operating overloaded. Although the Maltese grid is now also exposed to fluctuations in the Sicilian grid which may destabilise or disrupt normal service, experience with IC1 has shown that such situations are infrequent, and the protection systems installed protect the Maltese grid to a large degree. A second synchronous interconnector will not only satisfy the expected increase in demand in Malta, but will also provide a backup source to IC1, and a flexible reserve for intermittent RES and in case of local generating plant stoppages.

- Already existing infrastructure: The terminal station at Maghtab was designed for synchronous a.c. electricity transmission equipment. Altering this to d.c. transmission would result in the installation of a d.c. to a.c. converter which would require approximately 60,000-80,000m^2 area locally. A similar amount would also be required in Sicily for the conversion of a.c. to d.c. for energy transmission to Malta.

- Minimising impact on the environment: Minimising the impact of the project on the environment as no overground construction shall take place. The cable shall be laid completely underground and the shore approaches in Malta and Sicily shall be of the trenchless type. No construction shall take place at the Maghtab terminal station. The works within this station shall only consist of the cable laying, cable-switchgear termination and the installation of equipment (shunt reactor and protection equipment) within the existing buildings at the terminal complex.

8.0 A description of the Present Land Uses and Environmental Characteristics of the Site

The Area of Study is situated in the northern part of Malta as indicated in Figure 5.0.1 and Figure 5.0.2. The affected area starts at Qalet Marku Bay and the adjacent area to the Northwest with surface interventions towards the Maghtab Terminal Station which lies near the Wasteserv Facility at the limits of Naxxar.

The area is agricultural land and is included within the Central Malta Local Plan and falls under Policy NA04 dealing with the Protection of the Natural Coastal Area. This coastal area has been determined to be "*of high ecological, scientific and scenic importance and is identified in the Coastal Strategy Paper as a predominantly undeveloped and natural rural coastline*. "and "*The main aim of the policy is to conserve and safeguard the natural and cultural value of the protected coastal areas*." (See figure 8.0.1).

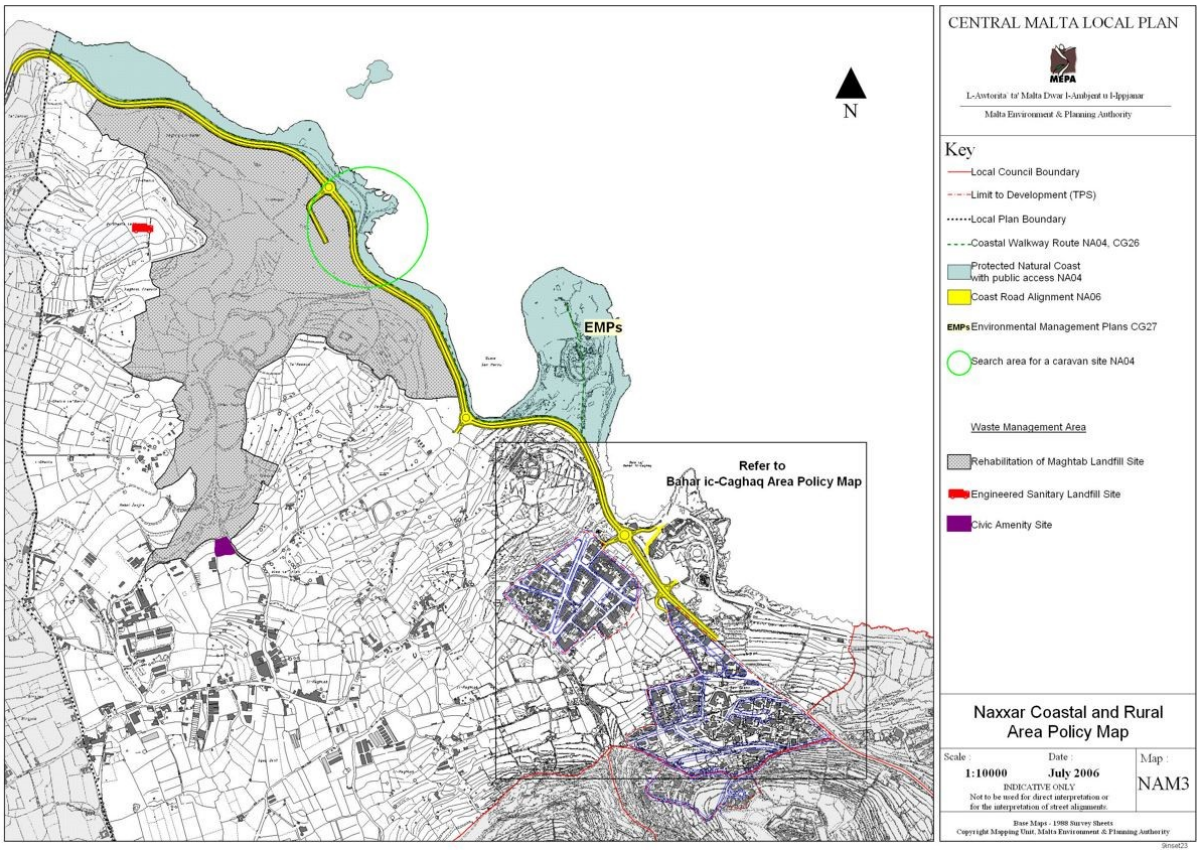

Figure 8.0.1 Policy Map NAM3

The landscape is dominated by the Wasteserv Maghtab complex, its associated waste management facilities and the Maghtab Terminal Station in the immediate vicinity. There are also other private waste processing facilities and a residence within the area of influence.

Previous projects in the area include:

PA 5396/09 which was the development permit under which the first interconnector was developed. This project encompassed the building of the Maghtab Terminal Station, excavation of the culvert/ trench to link the Maghtab Terminal building to the shore line and the excavation of the 132kV cable tunnels between Maghtab and Kappara. The present project is more limited in scope as it only deals with the trenchless shoreline approach and trenching works to provide for a transition joint pit and thereafter trenching/culvert and laying of the cable from the transition joint to the Maghtab Terminal Station. The civil work prepared in this application will be used to terminate the interconnection in the current 220kV Distribution centre and to house a transformer and a shunt reactor (similar to what is already installed on site) that will be procured and installed as part of this project in bunded areas already built and approved in the said scheme.

PA 3012/20 Waste to Energy plant at Maghtab – consisting of the construction of a plant to utilise household and commercial waste to recover energy to generate electricity which will be transmitted to the national electricity grid. The planned plant shall consist of:

- Tipping hall and fuel bunker which will receive the incoming waste;
- Furnace where the waste is burnt;
- Boilers where water is converted to steam for energy recovery;
- Flue gas treatment where the gaseous emissions are treatment before being released;
- Collection and treatment of recovered Incinerator Bottom Ash (IBA);
- Visitor centre;
- A pump house used for pumping sea water for cooling purposes

It is to be noted that while PA 5396/09 has been completed, the Wasteserv project PA/3012/20 is still undergoing its permitting process and, at the time of writing of this document, the development permit has not been issued and the proposal is still pending. It is listed in this section for the comprehensive description of the proposed developments in the area.

Each of the two developments above are much larger in scope than the IC2 interconnector cable project which only deals with the cable culvert/ trench between the shoreline and the Maghtab terminal station, and common to PA 5396/09, shall produce waste during construction only as no emissions shall take place during operation.

Depending on the onshore option chosen, cable will be placed in a trench and/or culvert either

- Along Triq ir-Ramla, being a secondary road and mainly surrounded by cultivated and abandoned agricultural land with sporadic thickets of trees. At the intersection with Triq Tul il-Kosta there is an intermittent watercourse exhibits natural reed beds that form part of Qalet Marku saline marshland and legally protected by G.N. 288 of 1995.

OR

- Within the Wasteserv Maghtab facility which is made of made-up ground composed mainly from construction rubble.

The interconnector landing point will be situated outwards at sea but will be connected to land via a trenchless solution passing beneath the seabed of Qalet Marku Bay in case of options 3 and 4 as per *Figure 7.2.3*.1. This bay consists of a small embayment which accumulates pockets of sand and drift leaf litter of seagrass, forming Posidonia banquettes. The nearby rocky shore is colonised by maritime garigue. The same features characterize the other options shown in *Figure 7.2.3*.1.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

9.0 Description of Surrounding Land Uses, Their Nature, Their Extent and Their Environmental Characteristics

The following description of the environmental characteristics of the project site surroundings is based on a terrestrial area enveloped within a 100m buffer from the project site boundaries.

9.1 Land and sea uses

The Maltese coastal waters in the area of the project are predominantly used for fishing, leisure craft and bathing activities. There are also fish-farms to the north of the landing point, but these have been avoided by the chosen routes. The project shall not alter the land use as it shall only consist of a trench or culvert through which the cable shall be laid. The onshore options are situated on disturbed ground (a public road or through the Wasteserv facility). The shore approach shall consist of trenchless approaches which will leave no permanent impact. Thus, no change in land use is expected.

The infralittoral area within Qalet Marku is characterised by dense Posidonia Oceanica meadows settled on matte along with occasional sandy patches. Further offshore, at a distance of approximately 5km, sandy patches become more common within a mosaic of posidonia oceanica and cymodocea nodosa settled on coarse sand as shown in Figure 9.1.1 and 9.1.2.

The Infralittoral area west to the Natura 2000 site L-Ghadira s-Safra is similar but with Posidonia oceanica settled on rock.

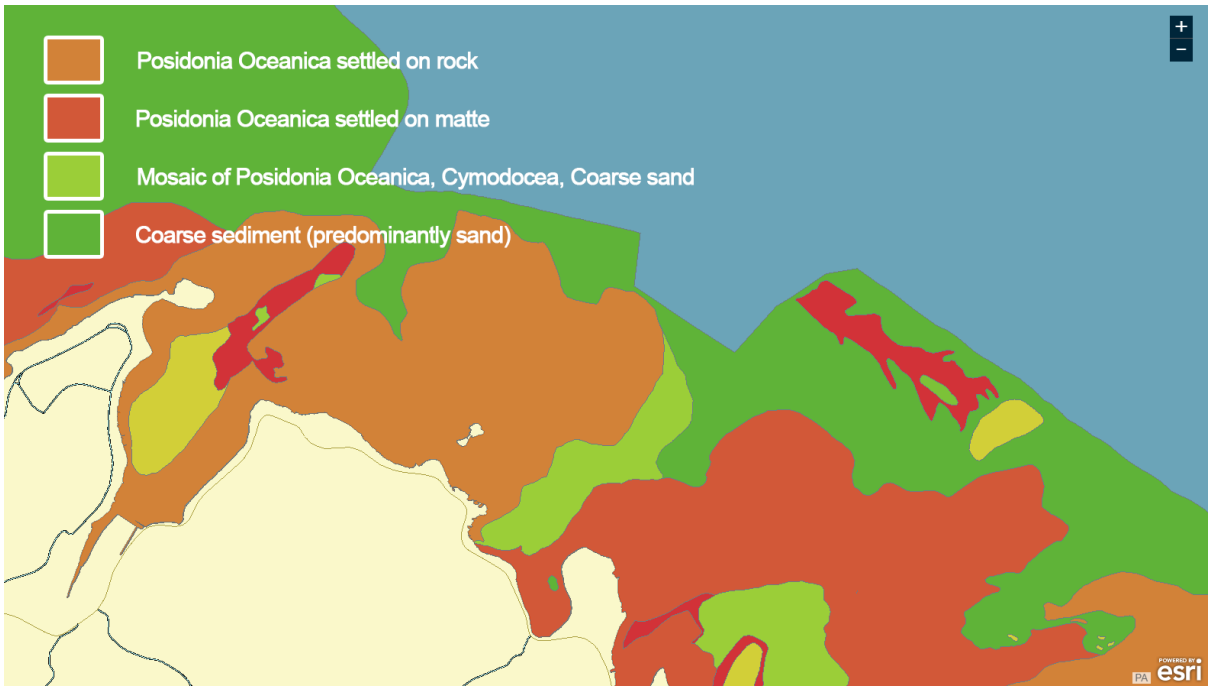

Figure 9.1.1: Marine data for proposed area (Source: PA website)

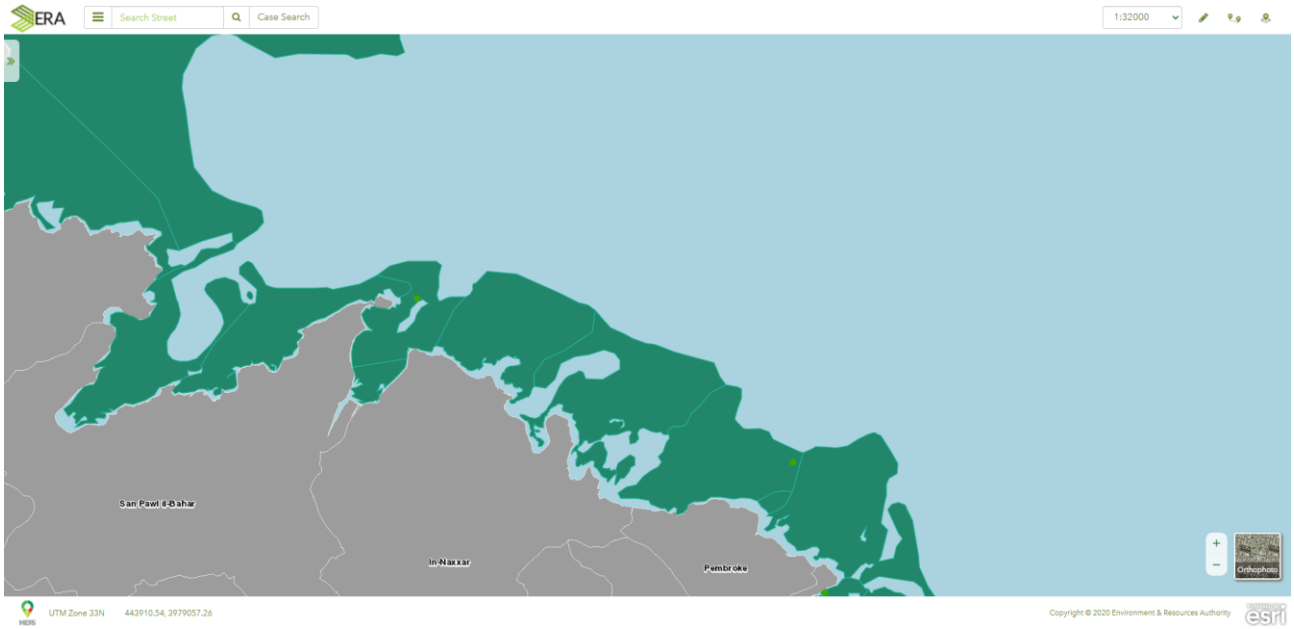

Figure 9.1.2: Posidonia Oceanica meadows (Source: ERA website)

9.2 Geology, Geomorphology and Hydrology

The project site lies within a formation of lower coralline limestone (refer to Figure 9.2.1). The area is composed from lower coralline limestone (Xlendi and Attard Members). Sensitive ecological resources are present around Triq ir-Ramla and the proposed landing points and include protected species and areas of garigue, a wetland, rocky shore and a pocket sandy bay.

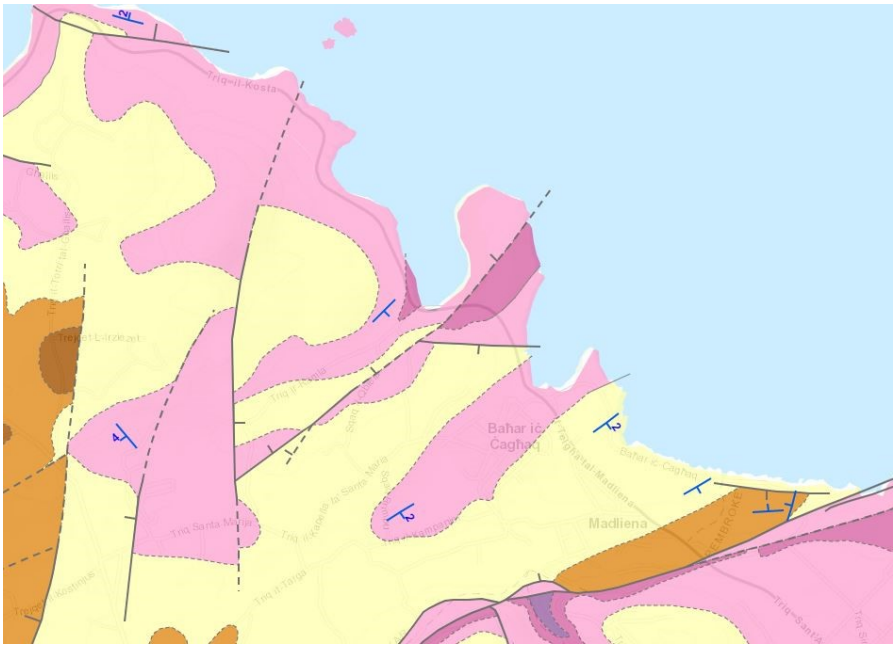

Figure 9.2.1: Geological Formation Qalet Marku (Violet/Pink - Lower Coralline limestone) (Yellow – Globigerina limestone) (Source: Cont shelf Dept)

9.2.1 Faulting

Numerous fault lines are located within the central Mediterranean being associated with the formation of the Malta Graben. Faults which are directed in an east-west and northeast-southwest direction seem to be more active.

A number of fault lines will inevitably be crossed by the cable. It should be noted that such crossings are not considered to be a major routing constraint since these were classified as 'buried faults'. Such classification was designated since the faults cut into the tertiary limestone formations without extending into the Plio-Pleistocene sedimentary fill.

However, it is difficult to determine the fault type, plane location and depth, and maximum expected displacement at the surface without carrying out a detailed marine survey. This survey should also include geohazard core sampling, and consider the following features in detail:

- Presence of debris or Unexploded Ordnances (UXO) due to the history of naval operations within the area
- Archaeological sensitive areas and environmental protected areas at Malta shore approach
- Restrictions from anchoring areas bunkering areas in Maltese territorial waters
- Restrictions from the potential presence of *Posidonia oceanica* and *Cymodocea nodosa* meadows
- Potential ancient ship wrecks
- Potential restrictions from fish farms in the vicinity of the Malta approach
- Fishing activities in the shallow waters (up to 100m in depth) possibly leading to a dedicated fishing interaction study

9.2.2 Gas Hazard

Gas hazards, if present within the route corridor options, would present cable laying constraints and possible instability issues during the operational phase from slope failure. These potential risks render gas hazards as one of the major geohazards of the study area. The preliminary geohazards assessment identified the presence of a fluid flow system within the entire study area, and this takes the form of gas venting, mud volcanoes and pockmarks. Thus, the presence of gas charged sediments and/or other gas or fluid emission features need to be identified through a marine survey prior to assessing this geohazard potential.

Such pockmarks should not be of constraint to the cable route since the dimensions have been reported to be limited, with an average depth of 0.6m and a maximum diameter of 22m. However, the potential presence of gas emissions and/or mud volcanoes within the scheme site must be taken into consideration and will be further assessed during the marine survey's post assessment studies.

9.2.3 Seabed slope stability

The cable route corridor options have been oriented such to avoid areas where failure events have previously occurred in order to avoid significant issues.

9.2.4 Seismic Hazard

Moderate seismic activity has been observed within the Sicily Channel, the majority of which are located in the surrounding areas. From the analysis of hazard maps with a return period of 475 years (i.e. 10% probability of exceedance in 100 years) it was concluded that the expected Peak Ground Acceleration (PGA) value is 0.12g.

9.2.5 Liquefaction Hazard

Liquefaction is defined as the weakening of saturated soils induced by seismic events or wave action which would result in a fluid like behaviour of the soils. This phenomenon can be observed in saturated loose sands and in soft low plasticity clays/silts. This hazard is more likely in deeper portions of the route corridor due to the possible presence of clays (uncohesive soils). Mechanical properties of these soils should be fully analysed in-situ and by means of laboratory tests during the marine survey.

9.3 Cultural Heritage Features

The proposed offshore routes were selected in order to avoid any interference with known underwater cultural heritage as shown in figure 9.3.1.

Regarding the onshore part, there are the Ta' Hammut Dolmens visible at the very edge of the buffer zone. These are classified as Class B and have a 50m buffer protection around them.

However, as the project shall take place within disturbed ground, there is very little chance of unearthing any significant cultural discoveries. However, the monitoring by qualified archaeologists and the continuous liaison with the Superintendence of Cultural Heritage is recommended during the onshore excavations.

A number of mitigation measures will be applied in order to reduce the negative impacts of the project on potential discoveries following the marine survey. These will be discussed and agreed with the respective competent authority.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

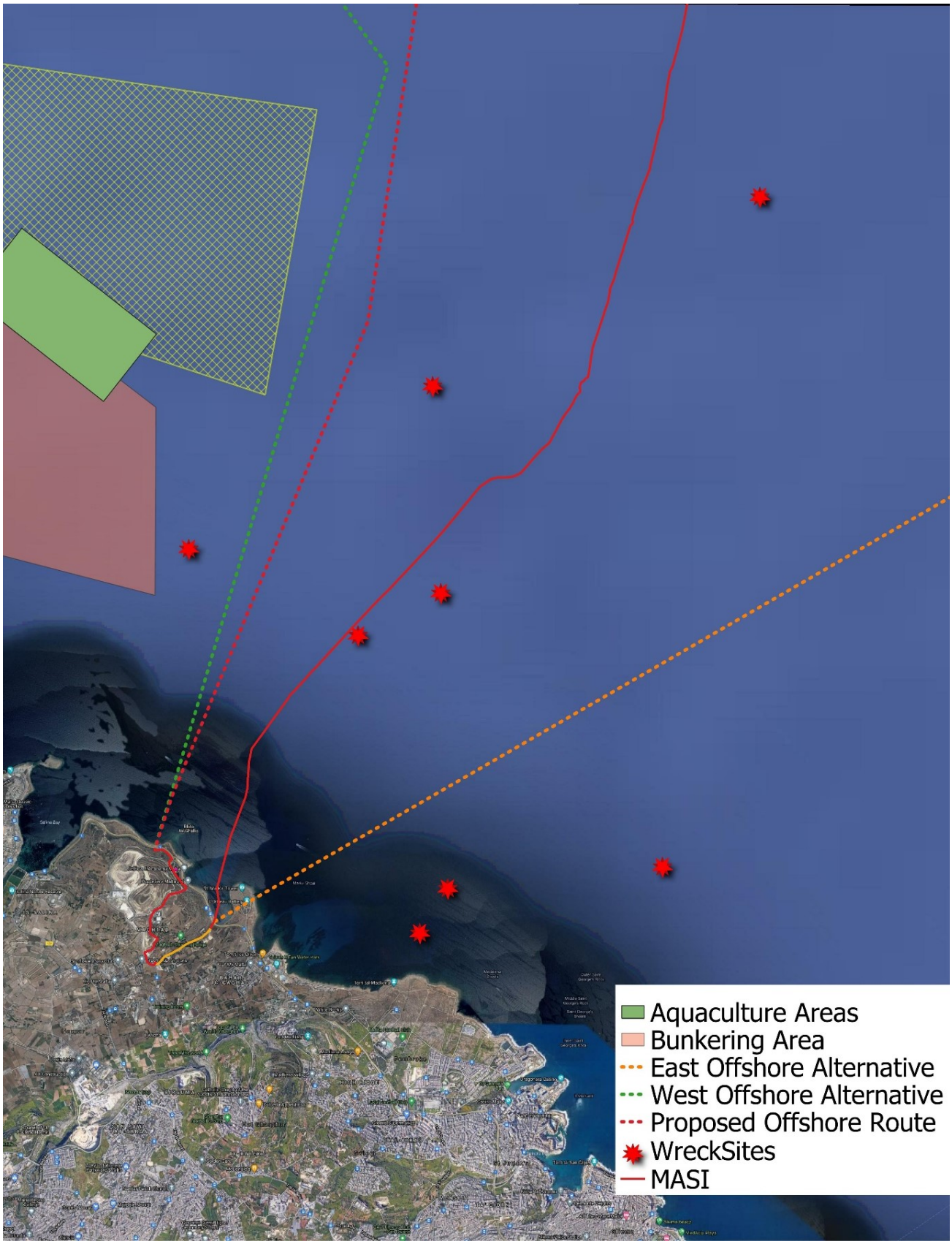

Figure 9.3.1: Known Wrecks in the vicinity of the proposed offshore routes

9.4 Ecology

The coastal fringe of the site is considered to be a coastal garigue. The proposed onshore cable trench will link Maghtab Terminal Station to the submarine cable entirely either beneath Triq ir-Ramla or through the nearby WasteServ Facility. The immediate surrounding area is largely dominated by agricultural land with an assortment of cultivated, ploughed or fallow fields while some fields are associated with Pinus halepensis (Aleppo Pine) and Eucalyptus gomphocephala (Tuart Tree) trees mainly associated with bird hunting activities. The southern part of Triq ir-Ramla encompasses the valley floor of Wied ta' Kieli, most of which has been reclaimed by agriculture except for the part closest to the shore where the remnants of a wetland, (mainly composed of a reed bed with rushes and sedges) are still preserved and is legally protected by GN 288 of 1995 as a SSI Level 2 and AEI at Levels 1 and 3 (figure 9.4.1). The karstland on the northern side of Triq ir-Ramla supports accumulations of Labiate garigue, andropogonid grass rocky steppe and ermes.

Posidonia Oceanica meadows lie within the Qalet Marku bay. The bay consists of a small embayment which accumulates pockets of sand and drift leaf litter of seagrass forming Posidonia banquets.

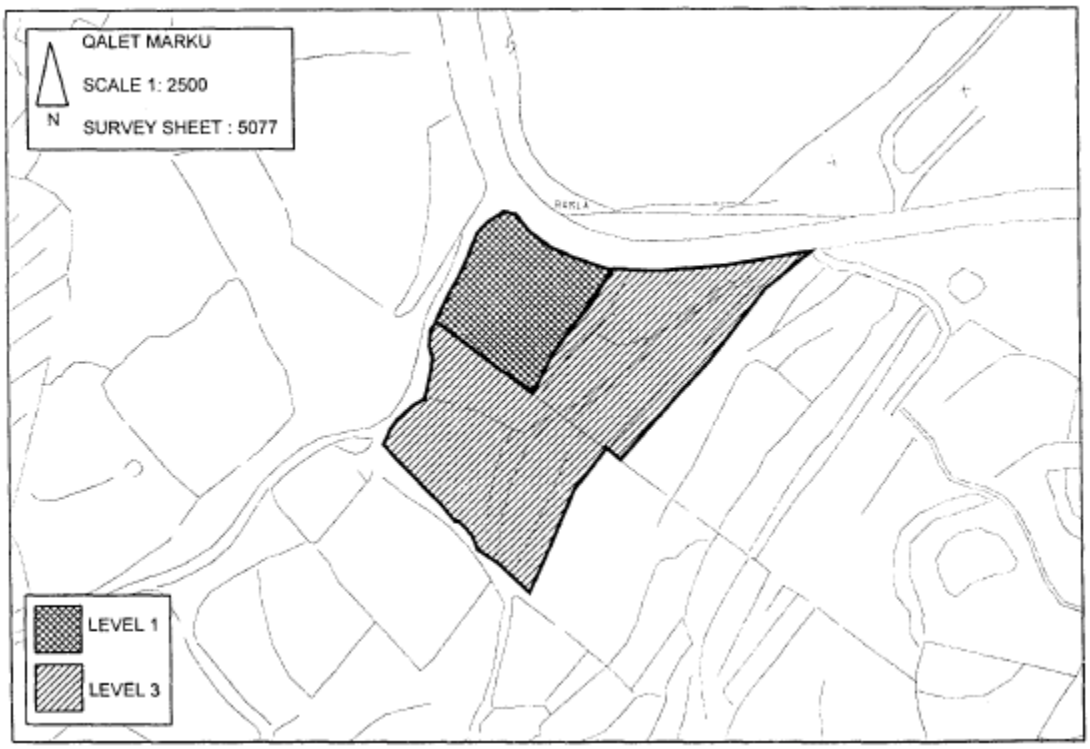

Figure 9.4.1: Qalet Marku Saline Marshland (IC1 EIA Terrestrial Ecology)

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

10.0 A Description of the Services Available on Site

10.1 Sewage, Energy and Water.

It is envisaged that the Maghtab terminal station will remain largely unmanned during the whole lifetime of the project with control being undertaken remotely from the Enemalta Control Centre at Marsa Administration Building. Therefore, any wastewater generated shall be as at present and will remain making use of a cesspit.

10.2 Surface Water Run-off and Storm Water Drainage.

It is not envisaged that there shall be changes in the present surface water run-off and storm water drainage systems due to this project

10.3 Other Crossings and Interferences

The Malta – Sicily channel is characterised by the presence of several cables which are mostly orientated in the NW-SE direction. All of these will have to be crossed by the project. There are also some communication cables between Malta and Sicily. Depending on the route chosen, the first interconnector may or may not be crossed, however this can only be determined once the exact route is chosen. Figure 7.2.2.1 shows the approximate positions of such crossings. These points are to be considered as indicative only. The actual positions shall be determined following the Marine Route Survey which will be carried out at a later stage during the project.

10.4 Other issues

10.4.1 UNECE Convention on the Transboundary Effects of Industrial Accidents

The project shall be connecting Malta and Sicily, and part of the project shall be installed within Italian and Maltese onshore and offshore territories. Thus, the project may impact Malta's position as regards the UNECE Convention on the Transboundary Effects of Industrial Accidents. This issue shall be studied in collaboration with the Maltese Competent Authority during the permitting stage.

10.4.2 UNECE ESPOO Convention

The Espoo (EIA) Convention sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.

As the project shall be developed in Italy and Malta, environmental impact will be assessed in both countries during construction and the ESPOO convention for cross border consultation in line with Part VII shall be followed.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

10.4.3 Permit Limits

There exists no common territorial border between Malta and Italy since the two countries are separated by the Malta – Sicily channel. The 12 nautical mile territorial limit defines the boundary limit for the Maltese Development Permit. Similarly, the 12 nautical mile limit defines the Italian Authorisation limit. For the area between these two offshore boundaries, the laying of the subsea cable on Malta's continental shelf requires a licence from the Continental Shelf Department in accordance with Regulation 5 of the Continental Shelf Regulations (S.L.535.02). Such a licence is required for the surveying, installation, laying and maintenance works. The median line, as defined in Article 2 of the Continental Shelf Act, is considered as the boundary limit for this license as shown in Figure 10.4.3.1

Such licence will not relieve the applicant of the requirement to obtain other required permissions and/or licences from any other relevant competent authorities in Malta. Other assessments emanating from other regulations including the EIA regulations in relation to transboundary projects may also need to be conducted.

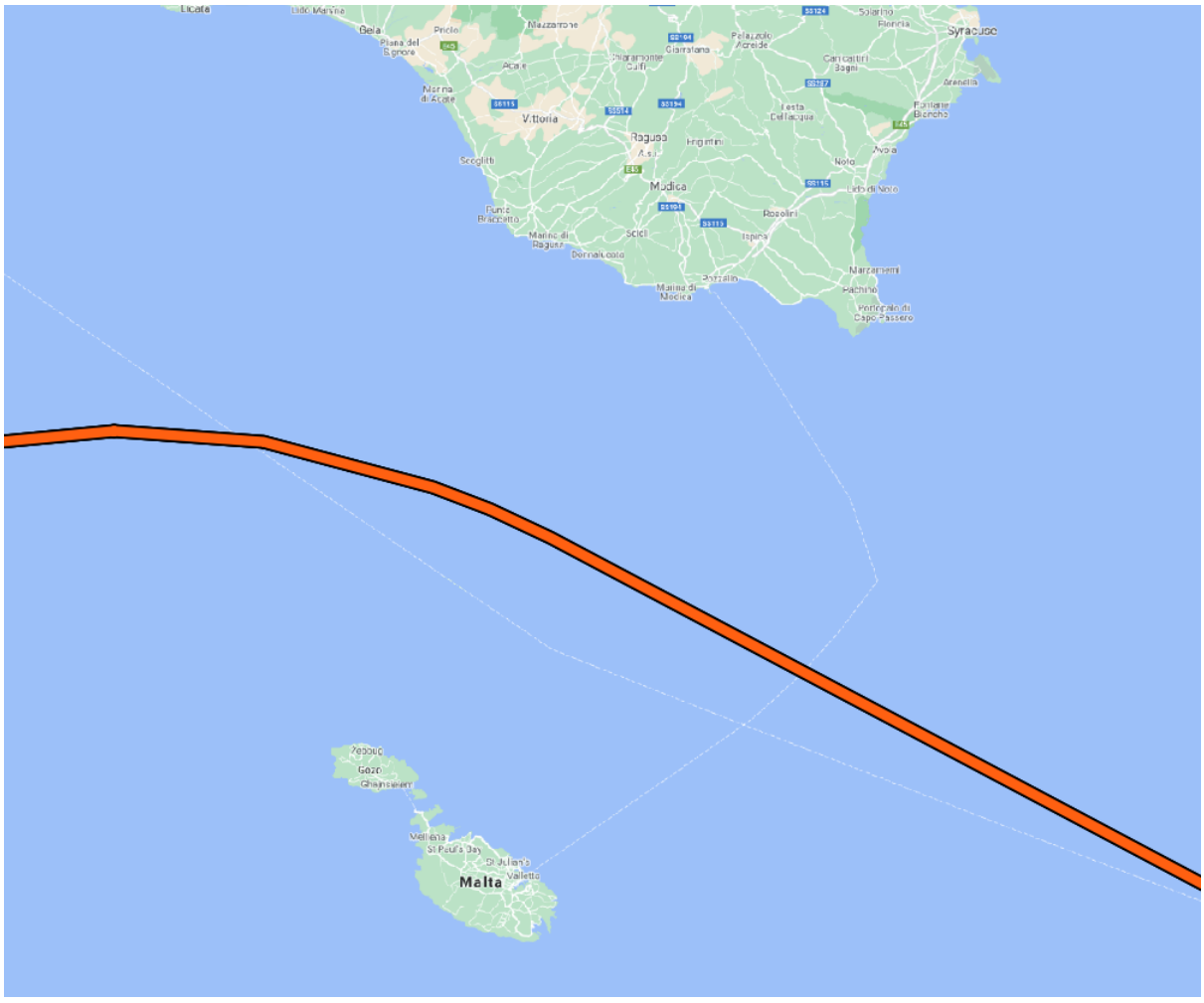

Figure 10.4.3.1: Position of the Maltese Continental Shelf Line between Malta and Italy

11.0 Number of employees in Each Phase of Development

At this early stage, it is not possible to give details of the number of contractor employees who shall be engaged during the construction and testing phases of the project. This shall be determined at a later stage.

There shall be no employees permanently manning the Maghtab Terminal Station during the operations phase. Normally operations are carried out remotely from Enemalta's National Control Room at Marsa. However, maintenance and repair operations shall be carried out on site.

12.0 Nature and Quantities of Raw Material, Energy, Waste and Machinery used during the Construction and Operation Phases

At this preliminary stage of the project, it is not possible to compile detailed information since there are a number of unknowns or detailed data is still unavailable.

The cable shall be designed, manufactured and tested to IEC standards and CIGRE recommendations. The length of the submarine cable is estimated to be between 97km to 102km depending on the final route chosen. The onshore cable is estimated to be between 0.8km and 2km in Malta and between 17.9km and 20.1km in Italy. Onshore equipment shall be limited to electrical equipment (shunt reactors/ transformers as well as control/ protection equipment) which will be installed in the existing Maghtab terminal.

The major land-based energy consumption during the construction phase shall be for the trenchless shore approach methodology (HDD or microtunnel).

Offshore, the energy consumption shall be associated with the vessels undertaking the underwater cable laying activities. As the cable works contract have as yet to be awarded, the number, names and characteristics of the vessels are still unknown. Thus, this information is not yet available.

No machinery is expected to be used during the operation of the project. Therefore, the energy requirements during the operational phases are minimal and associated with the remote operation of the equipment.

Waste shall be generated during the construction phase, and this shall be composed of the excavated material from the shore approach as well as from the excavation of the cable trench from the shoreline to the terminal station. The estimated amount of this shall be between 1,475 and 3,200 m^3 depending on the final onshore route and shore approach method undertaken. Minimal waste quantities shall be generated during the operation stage.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

13.0 Access and Parking Requirements

13.1 Access

Access to site shall be through Triq ir-Ramla. During the construction phase, access shall be required for the installation, testing and commissioning.

Following the construction and installation of the project, access requirements to the Maghtab terminal station shall be limited to authorised Enemalta p.l.c. personnel for maintenance and inspection purposes. The station is unmanned, controlled remotely from the Enemalta control centre at Marsa.

13.2 Parking

No additional parking requirements are considered necessary. The existing parking facilities at the Maghtab Terminal station are deemed sufficient.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

14.0 List of major environmental impacts and mitigation measures

A preliminary list of the potential environmental impacts arising from the project is shown in table below.

IMPACTS AND MITIGATION MEASURES

Features Potentially Impacted	Description of Potential Impact	Mitigation Measures
Land/sea use	No effect on land use. Cable shall be laid in an underground trench within disturbed ground (Wasteserv facility or Triq ir-Ramla). Temporary impact exists due to the establishment of a working pit for the trenchless sea approach and a transition joint pit which must remain accessible during operation. The cable route offshore corridors have been defined to minimise interferences with other existing sea activities (trawling, fishing, aquaculture zones and bunkering activities).	None needed long term. Temporary impact is to be mitigated through post works restoration methods. Final offshore route corridor chosen shall determine any mitigation measures that may be required.
Marine Environment	Broad brush assessment indicates that there will be no major negative impact on the marine environment but further detailed studies to map the marine habitat types that shall be impacted due to the project will be known when the marine route survey is carried out and the design contractor identifies the best area to carry out the shore approach trenchless activity. Cable protection techniques (cable burial and protection by rocks) may cause sea bottom sand dispersion.	Further marine and design studies required. Desktop dispersion study for the chosen route required as part of the technical studies.
Terrestrial Ecology	Lest for a minor area required to install a transition joint pit, no impact to terrestrial ecology expected as all works shall be carried out underground within disturbed ground.	None expected, however any mitigation measures needed will be determined in the EIA, if this is needed.
Agriculture	No impact to agriculture expected	None expected, however any mitigation measures needed will be determined in the EIA, if this is needed.
Cultural Heritage	No impact to known onshore cultural heritage objects is expected	Superintendent of Cultural Heritage and Underwater Heritage to be informed of project. Supervision by

	Marine Archaeology along the route and in shore proximity may be present but this will be determined following a marine route survey.	Archaeologist may be required. Marine survey to be undertaken to identify any wrecks/archaeological remains along the identified route.
Geology, Geomorphology, Palaenthology, Hydrology, Hydrogeology	The proposed trenchless methodologies shall introduce drilling fluids that have the potential to be absorbed by the ground in porous materials, fractured rocks etc. Should micro tunnelling be adopted, a pit would be required underwater in order to lift the thrust boring mechanism for transport	Mitigation measures to limit the leakage potential and these include creating bunds with sandbags, underwater screens and additives to plug holes in voids. Studies required to establish the exact position of such a pit and the effect on flora and fauna in the affected zone. Mitigation measures to be determined following such studies.
Landscape and visual amenity	No negative impact on landscape or visual amenity expected. All works will be carried out underground and no added buildings envisaged.	None expected, however, any mitigation measures needed will be determined in the EIA, if this is needed.
Air quality	Minor negative impact on air quality and possibly dust emitted during the construction/ installation phase. Major positive impact due to the displacement in emissions that would otherwise be required from local Power generation.	None expected, however any mitigation measures needed will be determined in the EIA, if this is needed.
Noise	Moderate localised negative temporary impact during excavation of the transition joint pit and shore approach works. A minor noise impact could be generated from the additional shunt reactor. However, the impact beyond precincts of the Maghtab should be considered insignificant. No noise impact expected during the testing, commissioning phases nor during the operational phase.	Very minor mitigation measures expected if the Contractor chosen abides by industry standards and practices in limiting noise emissions, however, any mitigation measures needed will be determined in the EIA, if this is needed.
Waste Management	Moderate negative temporary impact during the construction phase, due to the generation	A waste management plan may be requested either to

	of inert waste material from the drilling and trenching activities. No impacts are envisaged during the operational phase.	be submitted to the EIA or as a standalone document if an EIA is not needed.
Wastewater	No impacts envisaged since there is no expected discharge of water.	None needed.

Interconnect Malta Ltd.
12 Triq Spiru Mizzi,
Birkirkara BKR1762,
tel: +356 22208601
e: info@icm.mt

15.0 Annexes

Annex 1 - Preliminary Route Identification Report Second Malta – Italy electrical interconnector.