ATTACHMENT 3.1 PROPOSED MARITIME USAGE

Project Description to Inform the Maritime Usage Licence Application

IE001330-TT-EN-XX-RP-Z-0005

TETRA TECH

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1 Introduction

1.1 Project Background

Haulbowline Island is situated centrally within Cork Harbour approximately 14 kilometres southeast of Cork City, immediately south of Cobh and west of Spike Island (refer to **Figure 1-1**). Access to the island by road is via a bridge from Ringaskiddy at Paddy's Point. The bridge also provides access to Rocky Island, a small island approximately halfway between Paddy's Point and Haulbowline which accommodates a crematorium.

Haulbowline Island is currently in State ownership (Department of Defence (DoD)) and has undergone extensive industrial, maritime, and defence related use for more than 200 years. The island is circa 35 hectares (45 hectares including the quay area) and comprises a number of distinct elements as follows:

- The western portion which is operated as the headquarters of the Irish Naval Service by the Department of Defence and Defence Forces (circa 12.14 hectares);
- The eastern portion which formerly operated as a waste dump for the Irish Steel (ISPAT) operation but was developed as Haulbowline Island Amenity Park in 2018 (circa 9.22 hectares);
- The central east section of the site which includes the existing dockyard and basin that support the naval operations (circa 5.14 hectares); and
- The central west part of the island was formerly occupied by the Irish Steelworks Factory (ISPAT), whose operations commenced in 1938 and ran until cessation in 2001 (circa 8.78 hectares).

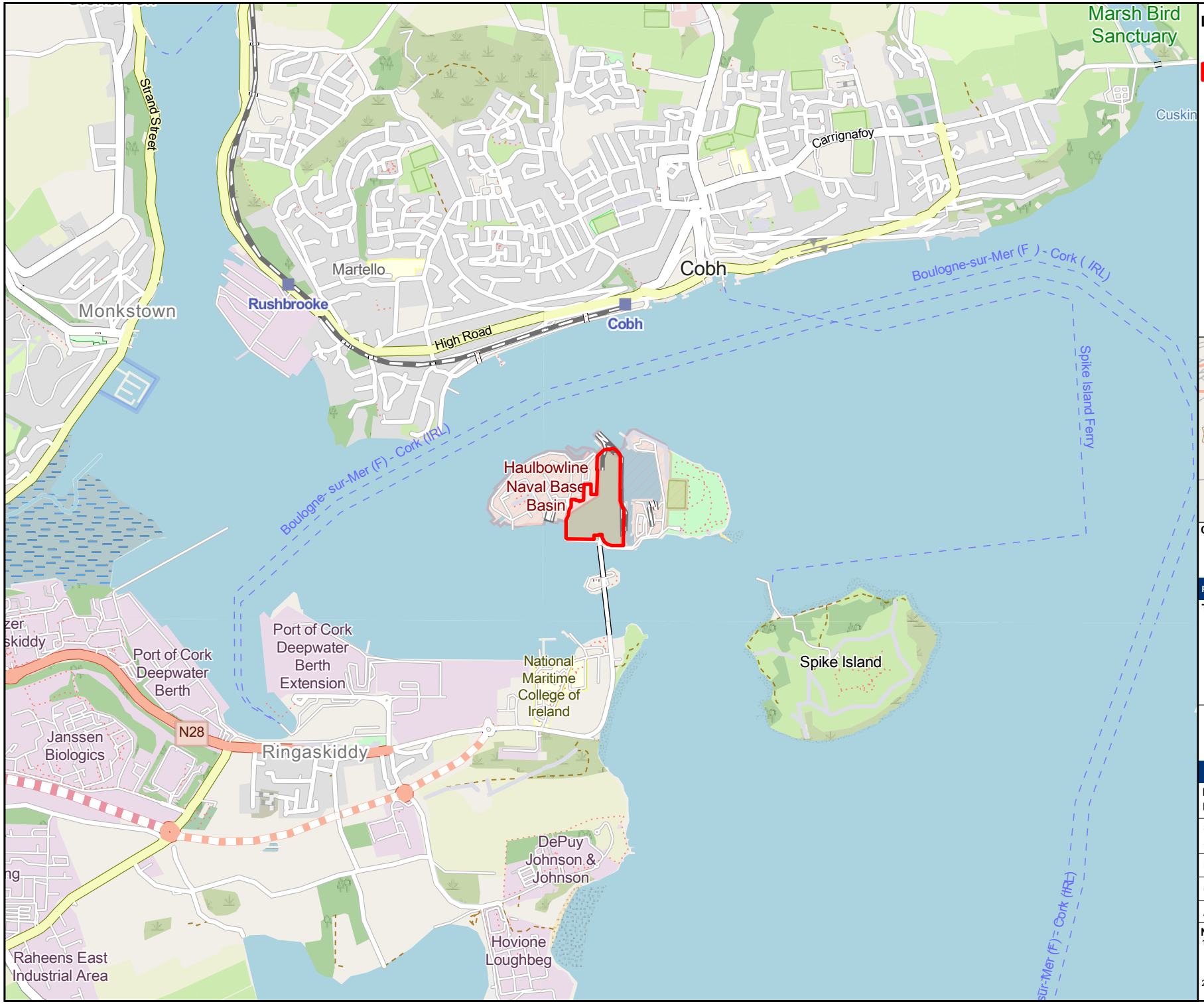
The DoD has identified the strategic need to develop the former ISPAT site to support the naval base to the west and the naval dockyard to the east. To facilitate the design of this development, an intrusive site investigation is required on the former ISPAT site.

Figure 1-1 shows the location and boundary of the of the former ISPAT site (in red) on Haulbowline Island, while **Figure 1-2** shows the MUL Areas relative to the State recognised Ungeneralised High Water Mark (HWM, in blue).

A Maritime Usage Licence (MUL) is required under Part 5 of the Act to carry out certain activities in the maritime area. Schedule 7 of the Act lists all the maritime usages which may be undertaken in maritime area pursuant to a MUL and includes the following:

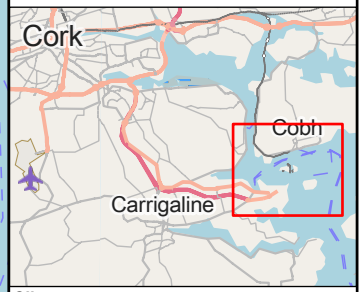
Marine environmental surveys for the purposes of site investigation or in support of an application under Part XXI of the Act of 2000.

In short, a MUL is required to undertake site investigations in the areas of the site identified as below the HWM. This report describes the nature and extent of the proposed site investigation works to be undertaken above the HWM to support the MUL application and associated environmental assessments.



Legend

BOUNDARY OF ISPAT SITE



Client

Dept. of Defence

Remediation of the former Irish Steelworks Factory Site

Title

Site Location Map

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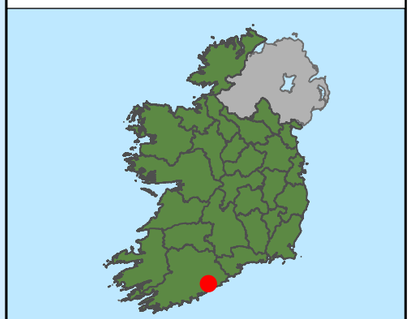
Legend

- Maritime Usage Licence Areas
- High Water Mark

Where the MUL area abuts the land, the boundary of the MUL area should coincide with and follow exactly the High Water Mark as defined by the Chief Boundary Surveyor

Drawn By:
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Scientist GIS

Data Sources: Tailte Éireann



Client

Dept. of Defence

Remediation of the former Irish Steelworks Factory Site

Title

Proposed MUL Map

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1.2 Project Objectives

This project phase relates to proposed intrusive site investigation below the HWM at the ISPAT site. The site investigation works are needed to support the design of the site remediation project. The site investigation works will establish the existing site conditions and inform the future design requirements. The primary aims of the proposed ground investigation works are to:

- Investigate subsurface characteristics of the site (via borehole drilling and trial pit excavation);
- Investigate the nature of the geological strata, both solid (bedrock) and overburden (soils and subsoils);
- Determine the engineering properties of the ground (via *in-situ* and *ex-situ* testing);
- Identify the presence of any irregularities in the subsurface (e.g., faulting) that may pose a risk to the remediation project;
- Determine the depths to bedrock, its quality and profile;
- Assess the presence and extent of soft and Made Ground; and
- Determine the nature and extent of Contaminants of Potential Concern (CoPC) present in shallow soils (e.g., asbestos, heavy metals, hydrocarbons).

The appointed contractor will produce a factual Ground Investigation Report (GIR) containing full details of the site investigation.

DoD intends to undertake intrusive site investigations below the HWM, including the advancement of up to 20 No. trial pits and 6 No. boreholes, in order to better understand the ground conditions and inform the design and delivery of the proposed remedial works. These SI works are fully detailed in **Section 2**.

1.3 Need for the Project

The SI works are necessary to inform the remedial design of the ISPAT site, which is of strategic importance as part of the DoD's national maritime infrastructure[1].

The SI works are a critical element required to establish the existing ground conditions and identify any potential constraints that may affect the proposed remediation design. The proposed works will provide essential information related to ground conditions, groundwater and environmental and human health contamination risks. Without the ground investigation the remedial design cannot proceed beyond a conceptual phase. It is therefore critical that this work is completed in a timely manner.

The Applicant is seeking a MUL for a period of five years from the date of the granting of the licence.

[1] Department of Defence. 2026. National Maritime Security Strategy - 2026 to 2030.

2 Project Description

2.1 Location of the Proposed SI Works

The indicative areas of the proposed SI works are shown in **Figure 2-1** and will be referred to as the MUL Area throughout the application documents. The MUL area is below the ungeneralised HWM and encompasses an area of 23,460m^2 (2.35ha).

The proposed SI works below the ungeneralised HWM will comprise intrusive ground investigations consisting of up to 20 No. trial pits, up to 6 No. boreholes and non-intrusive geophysical surveys. The indicative locations of the intrusive ground investigation points (boreholes and trial pits) are presented in **Figure 2-1**. These proposed locations are subject to minor refinement (typically less than 5m /in XY-axes). Similarly, a proposed borehole location may be moved due to the presence of obstructions / refusals, i.e., where a subsurface object (large boulder), prevents the advancement of the borehole. In such circumstances, the borehole will be moved to another nearby location (as close as practical to the original point) and re-drilled. A standard management of change protocol is adopted when this occurs.

For the avoidance of doubt, no construction works or site preparation works for potential future construction associated with the proposed investigation are included under this MUL application.

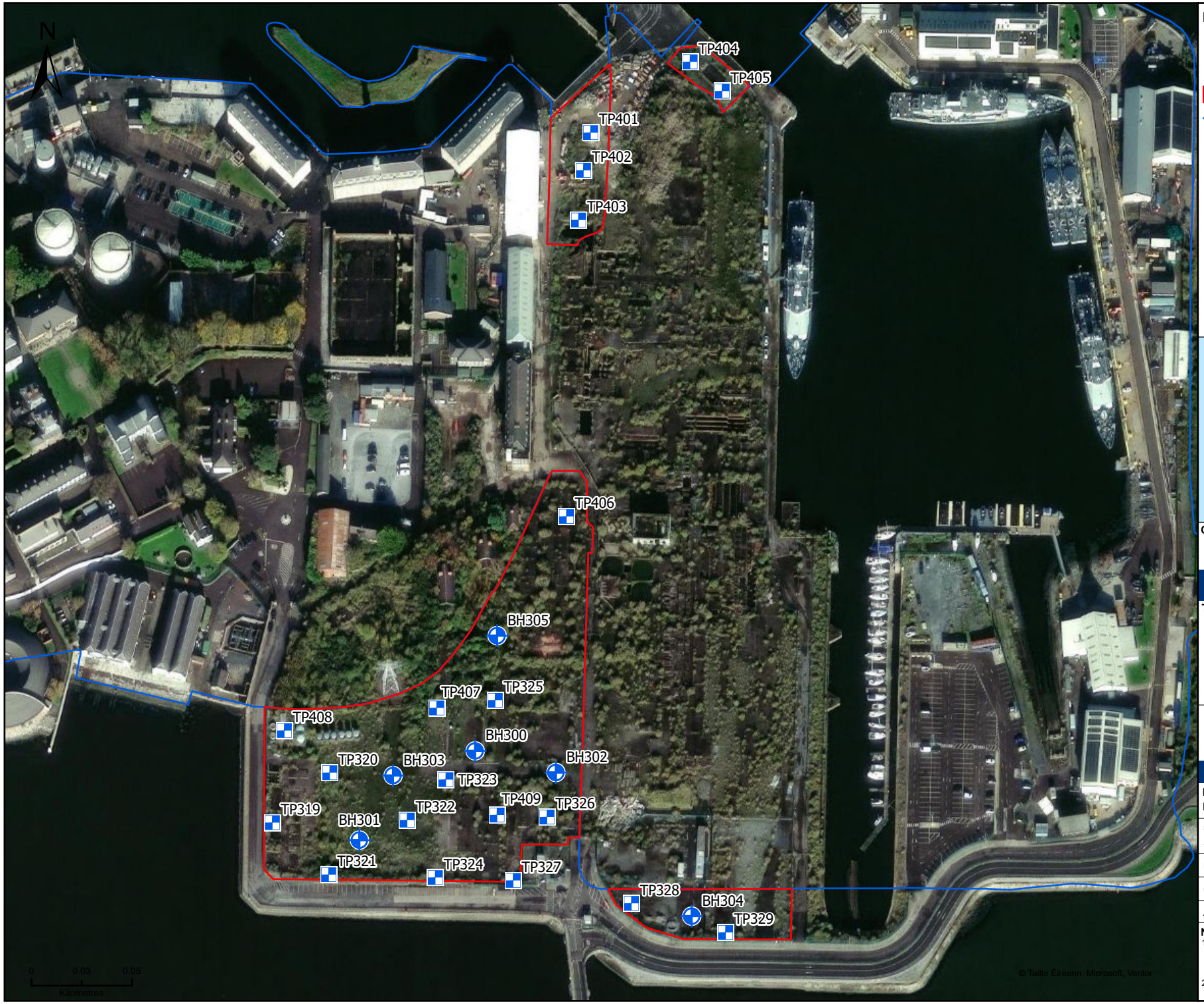
2.2 Description of the Proposed SI Works

In order to provide a reliable basis for design and development, the proposed works consist of up to 20 No. trial pits, up to 6 No. boreholes (incl. Standard Penetration Test (SPT)), and approx. 12 No. non-intrusive geophysical survey transects, all located below the HWM. No other SI works are proposed as part of this MUL.

The proposed SI works as detailed in this MUL include contingencies for follow up investigations that may be undertaken at refined locations. An overview of the SI works is presented in **Table 2-1** followed by a more detailed breakdown of the proposed investigation methodologies.

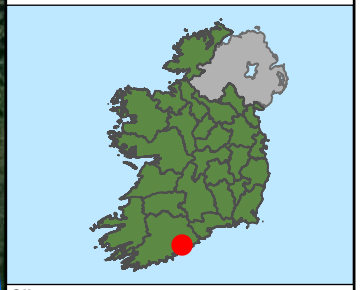
Table 2-1 Proposed Site Investigation Activities

Survey	Type	Equipment / Method	Number (No.)
Ground Investigation Works	Trial pit	22-tonne tracked mechanical excavator	20
Ground Investigation Works	Borehole drilling (incl. SPT)	Geobor S rotary core drilling rig	6
Geophysical Survey	Geophysical	Ground Penetrating Radar (GPR) transects	12



Legend

- Trial Pit Locations
- Borehole Locations
- Maritime Usage Licence Areas
- High Water Mark



Client

Dept. of Defence

Remediation of the former Irish Steelworks Factory Site

Title

Proposed Geophysical and Geotechnical SI Locations

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2.3 Trial Pits

Intrusive ground investigations involve the collection of samples of soil, groundwater and ground gas, the monitoring of groundwater and ground gas, and can be carried out using a variety of techniques. Trial pits are routinely specified where visual assessment of the shallow overburden (soils and subsoils) is required and allows a detailed examination of ground conditions.

Trial pits will be excavated to a standard target depth of 4.0m below ground level (bgl) via tracked mechanical excavator (e.g., Caterpillar® 320 or similar). During advancement of the trial pits geologic characteristics are logged and photographed by the project geologist, with geotechnical and environmental samples collected as required, in accordance with industry standards and best practice (e.g., Engineers Ireland, 2016 Specification for Ground Investigation[2]).

Excavated material will be temporarily stored and replaced following the sequence in which it was removed. Upon completion, pits are immediately backfilled with the excavated material, compacted and made safe. Existing land access routes to investigation locations will be used. There will be no requirement to move equipment or machinery via boat or barge as part of the proposed works. Depictions of typical trial pit investigation methods are provided in **Plate 2-1**.

The appointed Contractor (i.e., the Project Supervisor Construction Stage) shall provide for checking the proposed area for underground services. The area is to be scanned for underground services using a CAT scanner and plastic pipe detector and inspection pits are to be excavated using hand tools to a depth of 1.2m bgl where possible. Hand operated power tools may be used to assist excavation where hard strata such as road pavements / concrete paving (e.g., handheld concrete saw cutting) cannot be broken without the use of such tools. Use of all hand tools will be subject to approval of Contractor's Risk Assessment and Method Statements (RAMS).

[2] Engineers Ireland. 2016. Specification and related documents for Ground Investigation in Ireland, 2nd Ed. 2016.



Plate 2-1 Trial pit investigations

2.4 Rotary Core Drilling

It is proposed that the appointed ground investigation contractor use ‘Geobor S’ rotary core (RC) drilling techniques to advance geo-environmental boreholes. This industry standard drilling method is well suited to drilling through mixed ground conditions (i.e., Made Ground, estuarine / marine deposits and glacial till). RC drilling uses a water flush and recirculation tanks to core overburden (soils, subsoils) and rock (bedrock) from ground level. The target depths for rotary core drilling are approx. 15.0m to 20.0m bgl. Final depths will be determined based upon site-specific conditions encountered (e.g., presence of rockhead at shallow depth).

RC boreholes are cored from the ground surface, typically with standard penetration tests (SPT) or similar in-situ geotechnical tests, conducted at 1.5m intervals, until rock is encountered. Where rock is encountered, 5m of high-quality rock core (sample) is typically collected.

The first core run in each hole shall not exceed 1.0m in length. Thereafter, cores are to be removed in maximum 1.5m runs, reducing to 1.0m in highly weathered material. The Geobor S double core barrel and plastic liner system used will minimise the disturbance of overburden cores. The coring will terminate when the depths required have been reached or when instructed by the Investigation Supervisor.

The cores are packed in suitable boxes and removed to a dedicated store off-site for logging by a suitably qualified geotechnical engineer / geologist.

Cased open hole drilling may be permitted to progress through obstructions where approved by the Investigation Supervisor. The diameter of the bore should be sufficient to allow follow-on rotary coring with water flush. Any progress via open hole drilling must be fully cased off to ensure no flush loss during follow-on coring.

Continuous sampling “crowd in” sonic drilling may be employed with semi rigid core liner to progress the bores to rockhead. Where possible this should be by vibration only and not rotation which will require a flushing medium.

The sonic drilling shall be undertaken in a diameter sufficient to allow follow-on RC with water flush. The sonic bore should be fully cased to ensure no loss of flush into the overburden during follow on rotary core drilling.

For the borehole drilling works, the Contractor will use Geobor S rotary core drilling techniques. A Comacchio 602 rotary drill rig is suitable for the specified works and has been used in many similar projects. The Comacchio 602 can facilitate all drilling types required on-site (e.g., rotary core, sonic) and water flushing. Additionally, this rig has a narrow variable-width undercarriage, well-suited to a site characterised by its difficulty of access. The 602 also supports wireline core drilling, which enables use of the Geobor S system. The Geobor S may be used with sonic or conventional rotary drill bits. In soft formations with varied layers, the Geobor S automatically adjusts in such a manner that the core lifter case is protected, and borehole samples will not be subject to flush loss.

2.4.1 Standard Penetration Test

The Standard Penetration Test (SPT) is an *in-situ* dynamic geotechnical test carried out during ground investigations to assess the relative density or consistency of soil and to obtain a disturbed soil sample. SPT tests are routinely carried out using a standard methodology (*BS EN ISO 22476-3:2005*) during rotary core drilling through cohesive overburden.

The SPT test involves use of a standard split-spoon sampler which is driven into the base of the borehole using a standard 63.5kg hammer falling through approx. 760mm. The number

of hammer blows ('N') required to drive the sampler through the final 300mm of penetration, after an initial seating drive of 150mm, is recorded as the SPT 'N-value'. This value provides an indication of soil strength or density and can be used in the design of foundations, earthworks and other geotechnical structures.

In practice, SPTs are typically carried out at selected depths between drilling or coring runs rather than through the rotary core barrel itself. It is proposed to conduct multiple SPTs at each borehole during the ISPAT ground investigation, at 1.5m depth intervals, until rock is encountered.



Plate 2-2: Typical rotary core drilling works

2.5 Geophysical Assessment

2.5.1 Geophysical Survey Objectives

The main objectives of the geophysical survey will be:

- To confirm the location and depth of natural stratigraphy and manmade features such as utilities, thickness of concrete, voids, waste bodies, contamination plumes and buried structures (e.g., tanks, basements) across the site;
- To locate the gaps in the overburden and estimate its stiffness;
- To identify features that may interfere with intrusive works (i.e., drilling);
- To locate presence and extent of underground voids and cavities; and
- To identify possible weathering solution features (e.g., karst features) and other anomalies.

2.5.2 Proposed Geophysical Methods

Ground penetrating radar (GPR) shall be the primary geophysical method employed. GPR is a non-intrusive ground level survey frequently employed in site investigation projects. The GPR survey involves moving a small radar device across the ground, usually on wheels or mounted on a trolley. The device sends low-power radio signals into the ground. When these signals encounter changes below the surface - such as buried pipes, cables, foundations, voids, trenches, changes in ground material or other objects some of the signal is reflected back to the device.

The survey data is then reviewed and interpreted to identify possible underground features and estimate their location and depth. The results can be marked out on the ground and/or presented on drawings to help inform the design and planning of the proposed intrusive works.

The Ground Investigation Contractor will appoint an experienced and qualified specialist geophysical contractor to undertake the survey. GPR will be carried out along specified sections (transects) with final locations to be confirmed with the Investigation Supervisor. It is anticipated that multiple frequencies will be required to map near surface features and features at depths of 15m+ bgl. The transects locations will be recorded with high-accuracy GPS units.

The processing of the survey data shall include consideration for the known features on the site (e.g., multiple interconnected voids, subsurface infrastructure, and presence of Made Ground). A typical illustration of GPR is presented in **Plate 2-2**.

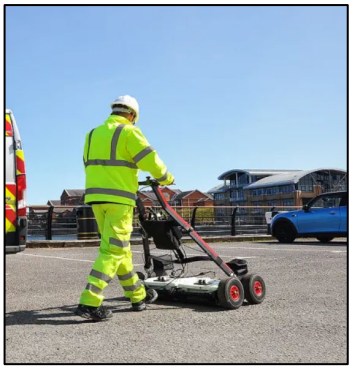
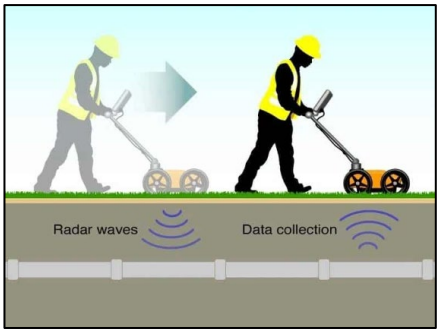




Plate 2-2 Typical GPR Survey

2.6 Sediment Control

The site investigation works are designed to ensure that there will be no impact to the marine environment. As such, the investigation will be required to employ tight controls around surface water runoff via sheet flow (i.e., overground). The proposed site investigation works are taking place at a minimum setback distance of 20m from the sea wall. The investigation methods proposed do not pose a direct risk to the marine environment.

Rotary drilling will involve the flushing of risings (soil, overburden, rock fragments), which will be performed with clean water. Water will be obtained from a clean and reliable source and will not impact the site's groundwater. All flushings will be contained in a mobile bowser within the works zone for removal and treatment at a suitable off-site facility.

There is the potential for limited ground disturbance, compaction and erosion from heavy machinery operations during the works.

The following measures will be employed to ensure no surface water runoff from the construction works zone enters the marine environment:

- No trial pits or boreholes will be located within 20 metres of the quay walls.
- No stockpiling of excavated soils / rock / concrete will be permitted over prolonged periods. All excavations will be backfilled as soon as the investigation work on that borehole or trial pit is complete, the ground reinstated and made safe.
- Existing access routes will be utilised by heavy machinery with no temporary construction of access roads / floating roads proposed.
- No direct discharge to ground from any element of the works will be permitted.
- The contractor will monitor weather forecasts for heavy rain and where required, certain works will cease to minimise potential for surface water run-off. Operations shall be carried out so as to minimise sediment runoff, and will not be completed during periods of prolonged or heavy rain (i.e. Met Éireann Orange rain warning);

- All machinery will be routinely checked to ensure no leakage of oils or lubricants occurs during the works. Any spillages will be immediately contained, and any impacted soil removed from the site and disposed of properly;
- The contractor will be required to have fully stocked on-site spill kits within each active works zone; and
- An Environmental Incident and Emergency Response Plan detailing the steps to be undertaken in the event of a spillage of chemical, fuel or other hazardous materials will be put in place by the contactor prior to commencement of works.

2.7 Site Investigation Programme

While the MUL application is for a five-year period, the site investigation works are anticipated to be phased as follows:

- Initial investigations in 2027 (circa 3 months duration) to support preliminary design of the capping system, roads and drainage systems; and
- Further follow up investigations at key locations to support the detailed design of structures in 2028-2031.

3 Sustainability and Climate

In line with current guidance and best practice (e.g., TII 2024 Ground Investigation Guidance, Part 1 and 2), the principals of sustainability in construction, circular economy and potential for climate impacts have been considered as part of this project. The need to mitigate these impacts are clearly signalled in national policy such as the Climate Action Plan 2025 (CAP25). We have also considered other related sustainability guidance, such as CL:AIRE's Sustainable Remediation Framework Guidance[3].

This project consists of a combination of intrusive and non-intrusive ground investigations which by their nature utilise heavy machinery and plant which will give rise to air emissions from diesel / petrol engines (i.e., greenhouse gas emissions). A 'sustainability through design' approach has been adopted by Tetra Tech from the outset and through careful consideration during the Ground Investigation specification process (i.e., avoid multiple remobilisations). Our post-fieldwork monitoring will utilise remote sensing and telemetry where possible.

This project does not include construction of new buildings, roads, infrastructure or other permanent design features for which embodied carbon assessments and mitigation may apply.

There is currently no available alternative to diesel powered RC drilling rigs / tracked mechanical excavators required for this project. As such the focus will be on limiting emissions through operational efficiency, reducing idling time and ensuring machinery is well-maintained. The appointed Contractor will be required to adopt sustainable best practices throughout the project duration. The Ground Investigation Contractor will be requested to include the following measures to reduce the emissions and hence potential climate impacts of the works:

- Regular maintenance of construction plant machinery, maintaining optimum efficiency;
- For electricity generation at site compounds, consider the use of hydrogen fuel-powered generators or electrified plant over traditional diesel generators;
- Turn off engines when machinery is not in use and avoid idling of machinery;
- Use of Hydrotreated Vegetable Oil (HVO) or other low carbon biofuels / blended fuels for all mobile plant employed for both site deliveries and on-site works;
- Use of electric vehicles where appropriate for plant machinery with designated charging points available at the naval base.
- Wherever available, the contractor shall secure construction materials from local/regional sources or sources within the State to minimise material transport

[3] CL:AIRE. 2025. A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.

emissions and reduce life cycle carbon emissions associated with the construction materials (i.e., embedded carbon).

- Sustainable timber post fencing will be specified over steel in boundary treatments where possible.
- The use of private vehicles by construction staff to access the site will be minimised through the encouragement of use of public transport, encouragement of car sharing, and maximising use of local labour to reduce transport emissions.