

SEATEC

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Maritime Usage Licence MUL230036

SS Ohio – Positional Verification and USBL Synchronisation Operations

Irish Exclusive Economic Zone | 51°N 52.720' / 014°W 16.880'

REVISED ANNEX IV RISK ASSESSMENT – UNDERWATER NOISE

Risk Assessment for Annex IV Species (RAAIVS)

Prepared in support of the Response to Request for Additional Information

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Executive Summary

This Revised Risk Assessment for Annex IV Species (RAAIVS) has been prepared by SEATEC in direct response to the Request for Additional Information issued by MARA on 08 December 2025 under Section 117(3) of the Maritime Area Planning Act 2021, in relation to Maritime Usage Licence application MUL230036.

The document replaces and supersedes any previous reference to an Annex IV Risk Assessment submitted as part of the original application. It reflects the revised and clarified scope of the proposed maritime operations, which are strictly limited to:

- Targeted, intermittent use of the Reson SeaBat T50 Multibeam Echo Sounder (MBES) for positional confirmation of a known seabed feature;
- Selective deployment of the EdgeTech 4200 Side Scan Sonar (SSS) for visual correlation with existing imagery; and
- Continuous operation of the Sonardyne Ultra-Short Baseline (USBL) acoustic positioning system for synchronisation of acoustic positioning data with previously acquired sonar imagery.

No sub-bottom profiler, airguns, or other impulsive acoustic sources will be deployed. The primary site investigation and wide-area seabed survey were completed in May 2023. The current application concerns only the final positional verification and equipment synchronisation phase required prior to recovery operations.

The assessment evaluates the potential for adverse effects on Annex IV species listed under the EU Habitats Directive (92/43/EEC), specifically cetaceans, the Eurasian otter (*Lutra lutra*), marine turtles, and bat species.

Key Conclusions:

- No impulsive or high-energy acoustic sources are proposed; all equipment operates in the non-impulsive, continuous-wave or frequency-modulated category.
- The operations are of short duration, spatially confined, and conducted at a distance of approximately 142 NM from the Irish coast and outside all designated Natura 2000 sites.
- The probability of Annex IV species being present within the Zone of Influence during operations is assessed as very low.
- No risk of injury, auditory impairment, or significant behavioural disturbance to Annex IV species is predicted.
- No derogation under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) is required.
- No further assessment under Article 6(3) of the Habitats Directive is considered necessary.

1. Introduction

1.1 Background and Application Context

SEATEC NV (hereinafter 'SEATEC') has applied to the Maritime Area Regulatory Authority (MARA) for a Maritime Usage Licence (MUL) under the Maritime Area Planning Act (MAP Act) 2021, application reference MUL230036. The licence is sought for activities comprising positional verification survey and USBL synchronisation operations in the Irish Exclusive Economic Zone (EEZ), in preparation for the recovery of non-ferrous metal cargo from the wreck of the SS Ohio.

The primary site investigation survey was completed in May 2023. The wreck of the SS Ohio, a French steamer of 8,719 GRT torpedoed on 7 March 1917 by U-44, was identified at a depth of approximately 330 metres at position 51°N 52.720', 014°W 16.880' — approximately 142 nautical miles west-southwest of the Irish coast.

Following a Request for Additional Information issued by MARA on 08 December 2025 under Section 117(3) of the MAP Act 2021, SEATEC submits this Revised RAAIVS as the formally required Annex IV Risk Assessment previously referenced but not attached in full to the correspondence of [December 2025].

1.2 Clarified Scope of Proposed Activities

The activities proposed under MUL230036 do not constitute a new site investigation or wide-area seabed survey. Their sole purpose is:

- Identifying specific, already-known seabed location(s) within the previously surveyed area; and
- Synchronising and calibrating USBL positioning data with existing multibeam and side scan sonar imagery to ensure accurate positioning of subsea equipment during recovery operations.

The operations will be conducted from the Offshore Supply Vessel N35 (Panama flag, IMO 8119637), classed DNV/GL 1A1 EO DPS 2 with DP2 dynamic positioning capability. Equipment to be deployed is limited to:

Equipment	Type / Mode	Purpose
Reson SeaBat T50 MBES	Non-impulsive, FM/CW; 200–400 kHz	Targeted positional confirmation; intermittent use only
EdgeTech 4200 Side Scan Sonar	Non-impulsive; 300/600 kHz dual frequency	Selective visual correlation with existing sonar data
Sonardyne USBL Positioning System	Non-impulsive acoustic; 20–34 kHz	Synchronisation of acoustic positioning with sonar imagery; continuous tracking

Not deployed: Sub-bottom profiler, airguns, sparkers, boomers, or any impulsive acoustic source.

1.3 Aim of this Report

This RAAIVS is prepared in accordance with MARA's Applicant Technical Guidance (V7, 2024) and Article 12 of Council Directive 92/43/EEC (Habitats Directive) as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended. Its aim is to:

- Identify Annex IV species with potential to occur in or near the operational area;
- Assess the potential for the proposed acoustic activities to result in deliberate disturbance, injury, or destruction of those species; and
- Determine whether a derogation licence under Regulation 54 is required.

1.4 Legislative and Regulatory Framework

The following legislation and guidance documents are relevant to this assessment:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive), Article 12 (species protection) and Article 16 (derogations);
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended — Regulations 51–54 (strict species protection and derogations);
- Maritime Area Planning Act 2021, Section 117(3) (additional information requests);
- MARA Applicant Technical Guidance Note (V7, 2024);
- NPWS (2014) Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters; and
- Southall et al. (2019) Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects.

2. Baseline Information and Receiving Environment

2.1 Site Location and Operational Context

The operations will be conducted at the position of the SS Ohio wreck: 51°N 52.720', 014°W 16.880', at a water depth of approximately 330 metres. The site is located approximately 142 nautical miles west-southwest of the Irish coastline, in the open Atlantic Ocean, within the Irish EEZ but outside Ireland's territorial sea (12 NM limit).

The site is:

- Outside all designated Natura 2000 sites (Special Areas of Conservation and Special Protection Areas);
- Outside the Rockall Bank SAC (c. 370 km NW of County Donegal), the Porcupine Bank SAC (c. 200 km west of Ireland), and the Porcupine Seabight SAC;
- In an open Atlantic oceanic setting with substantial water depth and strong background hydrodynamic energy;
- Not within any NAFO Regulated Area requiring special fisheries management.

The vessel will maintain station using its DP2 dynamic positioning system, eliminating the need for anchoring and minimising horizontal drift and the resulting acoustic footprint.

2.2 Relevant Annex IV Species – Screening

Under Article 12 of the Habitats Directive, all Annex IV(a) animal species are subject to strict protection. In the Irish marine context, relevant species include:

- All cetacean species (whales, dolphins and porpoises);
- Eurasian otter (*Lutra lutra*);
- Marine turtles (primarily leatherback turtle, *Dermochelys coriacea*, and loggerhead turtle, *Caretta caretta*); and
- All bat species occurring in Ireland (Regulation 51, 2011 SI).

Given the fully oceanic character of the site at 142 NM offshore and 330 m depth, the following species are scoped out of detailed assessment:

- Eurasian otter (*Lutra lutra*): A semi-aquatic, primarily freshwater and inshore species. The otter's foraging range in coastal environments is typically within 15 km of the shoreline. Occurrence at the project site 142 NM offshore is considered impossible and this species is formally scoped out.
- Bat species: All Irish bat species are terrestrial/semi-terrestrial foragers. Underwater acoustic surveys and vessel presence at 142 NM offshore present no plausible pathway for impact on bats. This species group is formally scoped out.

The assessment therefore focuses on cetaceans and marine turtles.

2.3 Cetaceans

2.3.1 Species Presence and Distribution

Irish waters support a diverse cetacean community. Species recorded in deep offshore Atlantic waters relevant to the project area include:

- Harbour porpoise (*Phocoena phocoena*): Primarily a neritic species typically associated with shelf and shelf-edge waters shallower than 200 m. ObSERVE Phase II data (Giralt Paradell et al., 2024) indicate low offshore encounter rates beyond the shelf break at depths greater than 200 m. Occurrence at the project site at 330 m depth and 142 NM offshore is considered possible but infrequent.

- Common dolphin (*Delphinus delphis*): Recorded across Irish offshore waters including areas beyond the shelf break. The species has a broad oceanic distribution. Occasional presence cannot be excluded.
- Bottlenose dolphin (*Tursiops truncatus*): Primarily associated with coastal and shelf waters. Offshore deep-water occurrence is less common. Low probability of presence at the site.
- Striped dolphin (*Stenella coeruleoalba*), Risso's dolphin (*Grampus griseus*), pilot whales (*Globicephala* spp.), and other pelagic cetaceans: The project site, at the outer Atlantic margin, falls within the known range of these open-ocean species. Sporadic occurrence is plausible.
- Sperm whale (*Physeter macrocephalus*) and beaked whales (Ziphiidae, including Cuvier's beaked whale *Ziphius cavirostris*): Deep-diving odontocetes with ranges extending across the deep-water Atlantic. Their presence in deep-water areas west of Ireland has been documented in ObSERVE surveys. Occasional occurrence at the project site is plausible.
- Fin whale (*Balaenoptera physalus*) and minke whale (*Balaenoptera acutorostrata*): Both species are recorded along the west and southwest Irish continental margin. Seasonal occurrence is possible.

2.3.2 Key Acoustic Sensitivities

Cetacean hearing sensitivity varies widely by species and functional hearing group. The Southall et al. (2019) framework defines five marine mammal hearing groups:

- Low-Frequency Cetaceans (LF): e.g., baleen whales — sensitive to frequencies below 1 kHz;
- Mid-Frequency Cetaceans (MF): e.g., delphinids including common and bottlenose dolphins — sensitive to 150 Hz – 160 kHz;
- High-Frequency Cetaceans (HF): e.g., harbour porpoise — sensitive to 200 Hz – 180 kHz; and
- Beaked Whales (BW): sensitive to 200 Hz – 100 kHz; particularly sensitive to mid-frequency sonar.

For the proposed equipment (MBES at 200–400 kHz, SSS at 300/600 kHz, USBL at 20–34 kHz), the primary operating frequencies lie in the ultrasonic range for MBES/SSS and the lower-ultrasonic/high-frequency range for the USBL. These are non-impulsive sources with highly directional beam patterns and rapid acoustic decay.

2.4 Marine Turtles

The leatherback turtle (*Dermochelys coriacea*) is the most commonly recorded marine turtle in Irish waters. Historically, leatherback turtles have been observed in deepwater Atlantic areas west of Ireland, following jellyfish prey. Loggerhead turtles (*Caretta caretta*) have been recorded on rarer occasions. Other turtle species are not considered plausible in this area.

Turtle abundance in the study area is expected to be very low. Leatherback turtles are not primarily acoustic in their sensory ecology and their hearing sensitivity is generally regarded as limited to low frequencies. The proposed equipment does not generate sustained low-frequency impulsive energy.

3. Risk Assessment – Underwater Noise

3.1 Source Characterisation

The three acoustic sources proposed are described and contextualised below in terms of their acoustic characteristics and potential Zone of Influence (Zoi).

3.1.1 Reson SeaBat T50 Multibeam Echo Sounder

The Reson SeaBat T50 is a high-resolution MBES operating in the 200–400 kHz range. It employs frequency-modulated (FM) and continuous wave (CW) pulse modes. Key acoustic characteristics relevant to this assessment are:

- Operating frequency: 200–400 kHz — well above the hearing sensitivity range of baleen whales and at the upper auditory range of most odontocetes;
- Source level: Typically 220–230 dB re 1 μ Pa @ 1 m (broadside); rapid attenuation due to high frequency and narrow beam;
- Beam pattern: Narrow swath (up to 150°), highly directional downward-looking beam — energy is focussed toward the seabed and rapidly attenuates in the water column;
- Pulse duration: Very short (typically 0.1–1 ms FM pulses); and
- Deployment mode: Intermittent and targeted — operated only as required for positional confirmation at discrete survey passes.

At operational depth of 330 m with strong sound attenuation at frequencies above 200 kHz (absorption coefficient >50 dB/km), the Zone of Influence for auditory disturbance is expected to be confined to well within 500 m of the vessel, and likely substantially less given the downward-directed beam geometry.

3.1.2 EdgeTech 4200 Side Scan Sonar

The EdgeTech 4200 is a towed side scan sonar operating at dual frequencies of 300 kHz and 600 kHz. Acoustic characteristics relevant to this assessment:

- Operating frequency: 300/600 kHz — at or above the upper hearing range of most cetaceans and well above the hearing range of baleen whales;
- Source level: Typically 200–210 dB re 1 μ Pa @ 1 m; and
- Beam pattern: Highly directional lateral swath — energy directed toward the seabed with very limited vertical propagation.

The SSS will be deployed selectively for visual correlation only. At 300/600 kHz, acoustic absorption in seawater is very high (>50–100 dB/km), resulting in extremely limited propagation range and negligible potential for disturbance beyond a few hundred metres at most.

3.1.3 Sonardyne USBL Acoustic Positioning System

The Sonardyne USBL system operates in the 20–34 kHz range, using acoustic transponder-transceiver communication. Characteristics:

- Operating frequency: 20–34 kHz — within the HF cetacean hearing range and potentially detectable by porpoises and some delphinids;
- Source level: Typically 180–195 dB re 1 μ Pa @ 1 m; narrow directional transmission;
- Pulse mode: Short pings (interrogation-response) with low duty cycle — not a continuous high-energy source; and
- Purpose: Continuous positional tracking of underwater equipment — operational throughout the survey phase.

The USBL system represents the most relevant source for potential cetacean behavioural response given its operating frequency. However, its source levels are moderate, its duty cycle is low, and the acoustic propagation at this depth (330 m) in open Atlantic conditions will be constrained by acoustic spreading and absorption. Behavioural disturbance Zoi is estimated at up to 500 m; injury thresholds are not expected to be approached.

3.2 Impact Assessment by Species Group

3.2.1 Cetaceans – Injury and Mortality

Auditory injury in cetaceans (Permanent Threshold Shift, PTS; or Temporary Threshold Shift, TTS) arises from exposure to high Sound Pressure Level (SPL) or accumulated Sound Exposure Level (SEL) values. The Southall et al. (2019) injury thresholds specify:

- For HF cetaceans (harbour porpoise): PTS onset at weighted SEL of 155 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$; TTS onset at 140 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$;
- For MF cetaceans (delphinids): PTS onset at 185 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$; TTS onset at 170 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$; and
- For LF cetaceans (baleen whales): PTS onset at 183 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$; TTS onset at 168 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$.

Given the non-impulsive nature of the sources, high operational frequencies (200–600 kHz for MBES/SSS), limited duty cycles, and short operational durations, the cumulative SEL required to approach TTS thresholds is not expected to be reached by any cetacean in the area. Animals would need to remain within the immediate vicinity of the vessel (<100 m) for extended periods to accumulate sufficient acoustic energy. This scenario is considered extremely unlikely given normal cetacean avoidance behaviour.

Assessment conclusion: Negligible risk of injury or mortality to cetaceans.

3.2.2 Cetaceans – Behavioural Disturbance

Behavioural responses in cetaceans may occur at lower received levels than injury thresholds. The potential for disturbance is assessed against the precautionary principle, particularly for beaked whales, which have demonstrated sensitivity to mid-frequency sonar.

Relevant factors reducing the behavioural disturbance risk are:

- All sources are non-impulsive; impulsive sources (airguns, explosives) are the primary concern for beaked whale strandings — none are used in these operations;
- MBES and SSS operate at frequencies above or at the upper hearing limit of most cetaceans; energy propagation at 200–600 kHz is severely limited in range;
- DP2 station-keeping minimises vessel manoeuvring, repeated transects, and unnecessary acoustic exposure;
- Operations are spatially confined to a single known target location rather than covering a broad survey corridor;
- The open Atlantic environment provides cetaceans ample opportunity to move away from any acoustic stimuli without displacement from critical habitat; and
- Operations are of limited total duration.

Assessment conclusion: Low risk of behavioural disturbance; any disturbance would be temporary, localised, and not result in displacement from critical habitat.

3.2.3 Marine Turtles

Marine turtles have limited hearing sensitivity, primarily in the low-frequency range (<1,000 Hz). The proposed equipment operates predominantly at frequencies well above this range. No impulsive low-frequency sources are proposed. The likelihood of a leatherback turtle being present at the site during the limited operational period is very low.

Assessment conclusion: Negligible risk of injury or disturbance to marine turtles.

3.3 Mitigation Measures

Notwithstanding the low assessed risk, SEATEC commits to implementing the following proportionate mitigation measures in accordance with best environmental practice:

- Pre-operational visual watch: A minimum 30-minute passive visual watch for marine mammals will be conducted from the bridge prior to commencing acoustic operations. Operations will not commence if cetaceans are observed within 500 m of the vessel;
- Soft-start / power ramp-up: Where practicable, USBL and MBES systems will be ramped up gradually from minimum power settings prior to reaching operational levels, allowing animals to move clear;
- Suspension of operations: If cetaceans are observed within 500 m during operations, acoustic output will be reduced to minimum or suspended until animals have moved beyond the exclusion zone and have not been observed for a minimum of 20 minutes;
- DP2 station-keeping: The vessel will maintain fixed position using DP2, avoiding unnecessary transiting and associated acoustic exposure; and
- Operations log: A dedicated environmental log will be maintained recording all pre-operational watches, species sightings, and any operational suspensions.

3.4 Cumulative and In-Combination Effects

A review of available information does not identify any concurrent or planned acoustic survey activities within the vicinity of the SS Ohio site. Given the remote offshore location (142 NM from the Irish coast) and the very limited spatial extent of the operations, in-combination effects with other plans or projects are not considered plausible.

The broader site investigation was completed in May 2023. The current operations are specifically designed to minimise the acoustic footprint relative to that earlier campaign. Cumulative effects are therefore assessed as negligible.

3.5 Summary Risk Table

Species Group	Impact Pathway	Likelihood	Severity	Residual Risk
Cetaceans (all species)	Injury / PTS from acoustic sources	Negligible	High (if occurring)	Negligible
Cetaceans (all species)	TTS / auditory impairment	Negligible	Moderate (if occurring)	Negligible
Cetaceans (all species)	Behavioural disturbance	Low	Low – temporary displacement only	Very Low
Marine Turtles	Injury / disturbance from acoustic sources	Negligible	Low (given limited hearing overlap)	Negligible
Eurasian Otter	Any pathway	None – scoped out (142 NM offshore)	N/A	Negligible
Bat species	Any pathway	None – scoped out (142 NM offshore)	N/A	Negligible

4. Conclusion and Derogation Determination

This Revised Risk Assessment for Annex IV Species (RAAIVS), prepared in accordance with Article 12 of the EU Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, concludes as follows:

4.1 No Deliberate Disturbance, Injury, or Destruction of Annex IV Species

The proposed activities — limited to targeted, intermittent use of non-impulsive acoustic equipment (Reson SeaBat T50 MBES, EdgeTech 4200 SSS, and Sonardyne USBL) for positional verification and synchronisation purposes — will not result in the deliberate disturbance, injury, or destruction of any species listed under Annex IV of the Habitats Directive. The non-impulsive, high-frequency nature of the equipment, the confined spatial extent of operations, the limited operational duration, and the implementation of proportionate mitigation measures collectively ensure that adverse effects on protected species are avoided.

4.2 No Derogation Required

SEATEC confirms that no derogation under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) is required in connection with this application. The strict protection requirements of the Habitats Directive will not be infringed by the proposed activities.

4.3 No Further Assessment Required

It is the conclusion of this assessment that the proposed maritime activities will not have a significant effect on any Annex IV species, either individually or in combination with any other plans or projects. No further Appropriate Assessment under Article 6(3) of the Habitats Directive is considered necessary in relation to the Annex IV species assessment.

Should MARA or its advisors require any additional clarification or supplementary information, SEATEC remains available to respond at the earliest convenience.

5. References

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive). Official Journal of the European Communities.

European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended.

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