



Port of Cromarty Firth Dredge and Disposal Licence Environmental Supporting Document



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1 Introduction

A Marine Licence for Dredging and Sea Disposal is requested from Marine Directorate under the Marine (Scotland) Act 2010 for proposed maintenance dredge works at the Invergordon Service Base (ISB). This application is being submitted by Affric Limited (Affric) on behalf of the Cromarty Firth Port Authority, trading as Port of Cromarty Firth (PoCF).

Dredging is required across the ISB as surveys show that there has been a build-up of natural material within berthing areas. Dredging will be required at the Queen's Dock, Berths 1, 5 and 6 (noting that Berths 5 and 6 are known as Quay West), West Harbour and Saltburn Pier. The proposed maintenance dredge is key for PoCF to retain existing market share and attract new customers in both the offshore renewables and, cruise sectors by facilitating the berthing of larger vessels. As such, dredging is required in order to maintain suitable water depths for operations.

The purpose of this document is to provide supporting information to the marine licence application process. It includes details of the location of the proposed dredge, the proposed methodologies, outlines how the works align with the NMP and considers potential environmental impacts. Furthermore, this report details mitigation measures which should be implemented to reduce any potential negative effects identified.

The marine dredge licence application is supported by:

- a Best Practicable Environmental Option (BPEO) Report (Affric, 2024a) to consider the disposal of marine sediments arising from the dredging work; and
- a Habitats Regulation Appraisal (HRA) screening supporting document (Affric, 2024b) to consider the potential effects on designated sites.

Along with sediment sample results, these reports will inform and compliment this supporting document and will be submitted as part of the application documentation for a dredge and disposal licence.

2 Works Description

2.1 Location

The Cromarty Firth is situated on the east coast of the Scottish Highlands approximately 22.5 kilometres (km) north of Inverness and 105km southwest of Wick. The ISB is located on the north shore of the Cromarty Firth, on the southern edge of the town of Invergordon. The ISB is situated approximately 11km west of the headlands of Nigg and Cromarty (known as the Sutors, respectively north and south), which form the mouth of the Firth.

PoCF's statutory harbour boundary encompasses the Cromarty Firth between the Cromarty Bridge in the west and the Sutors, and an area to the east of the Sutors, see Figure 2.1, as available from Marine Directorate's National Marine Plan Interactive (NMPI) (Marine Scotland, 2024). The Harbour extends out from the Cromarty Bridge through the Cromarty Firth to 5742.480'N northeast of the North Sutor and to 352.140'W southeast of the South Sutor.

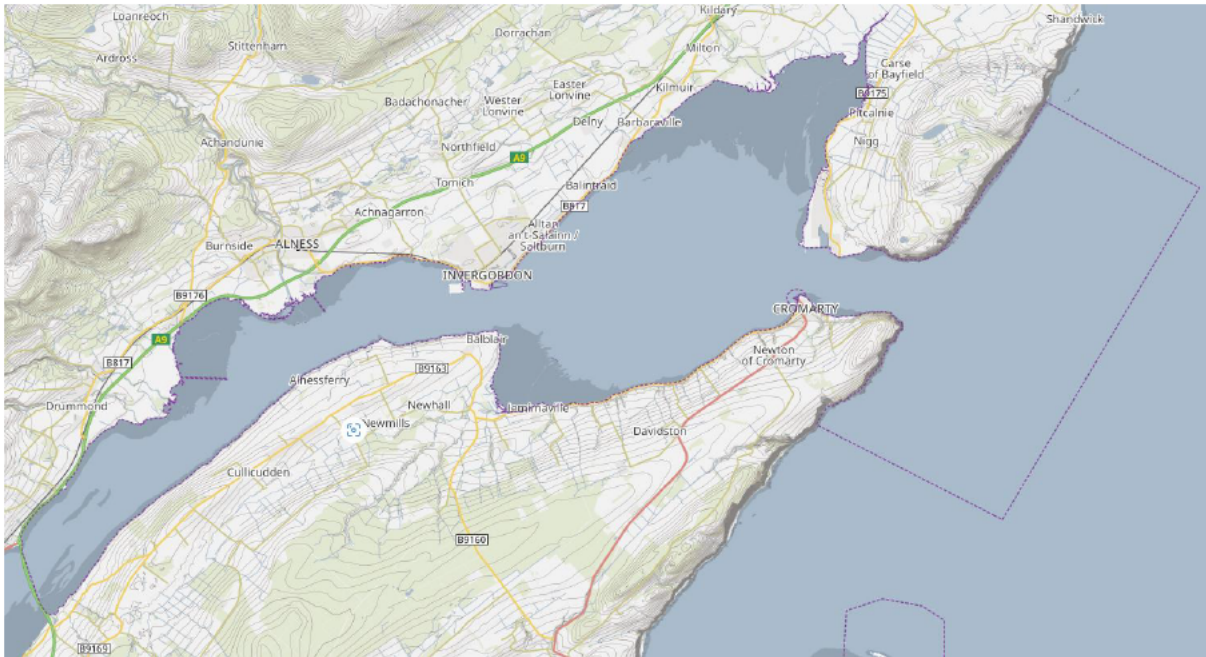


Figure 2.1: PoCF Statutory Harbour Boundary (Marine Scotland, 2024)

Maintenance dredging is required in the Queen’s Dock, Quay West, Berth 1, the West Harbour and alongside Saltburn Pier as shown in Drawing 129_DRG_02_01.

2.2 Project Need

The ISB supports a range of sectors including onshore and offshore renewables, oil and gas, and tourism industries. The deep and sheltered waters of the Cromarty Firth allow for the PoCF to support these industries. Continued support, however, will rely on maintenance dredging to sustain appropriate depths required to accommodate the safe navigation of large vessels. Material has built up across the ISB and will require dredging in order to maintain operational depths of between -3 and -14.5 metres (m) Chart Datum (CD), see depth per area below. This will ensure appropriate water depths are maintained for all users and will allow for safe navigation and access to the quayside for vessels. The dredge will also ensure the continued operations of the local lifeboat which berths in the West Harbour.

The list below provides details of dredging depths to CD required in each area:

- Queen’s Dock – Maintain to -12m;
- Berth 5 – Maintain to -12m;
- Berth 6 – Maintain to -12m;
- Berth 1 – Maintain to between -3 and -7m;
- West Harbour – Maintain to between -2 and -3m; and
- Saltburn Pier – Maintain to -6m on inside of pier and maintain to -11.5m outside with a slope at the end between the two areas.

Maintenance dredges at the ISB will be necessary and conducted in subsequent years within the three-year licensing period as and when required to remove any build-up of material above operational depths to ensure continued operations and safe navigation. Dredge requirements have been grouped into four areas, the Queen’s Dock, Quay West (comprising of Berths 5 and 6), West Harbour (comprising of the West Harbour and Berth1) and Saltburn

Pier. Expected quantities to be removed from each of the dredge areas per year are shown in Table 2.1.

Table 2.1: Expected Dredge Quantities in Wet Tonnes per Year

Year	Queen's Dock	Quay West	West Harbour	Saltburn Pier
1	230,000	10,000	20,000	2,000
2	40,000	10,000	10,000	2,000
3	40,000	10,000	10,000	2,000

2.3 Dredging Methodology

Following the assessment of available options, a combination of dredge and disposal using backhoe and cutter suction methods have been identified as the most appropriate dredging methodologies. Bottom dumping vessels transferring material to the disposal site will be required to adhere to a fixed route and limited speed. Dredge material will be disposed of at the nearby disposal site CR019, the 'Sutors,' located approximately 10km east at the mouth of the Cromarty Firth between the North and South Sutors. In addition to dredge and disposal, plough dredging will be utilised to remove high spots and to deal with small areas of build-up.

The first year of the maintenance dredge works will remove areas of seabed material which are currently above the required operational depths within the ISB area. Material will be removed from an area of approximately 160,403m².

3 Statutory Context

As the proposed maintenance dredge works will be conducted entirely below Mean High Water Springs (MHWS) and within 12 nautical miles (nm) of the Scottish Coastline, the project falls within the remit of the Marine (Scotland) Act 2010. The 2015 Scottish National Marine Plan (NMP) (The Scottish Government, 2015) covering inshore waters is a requirement of this Act. The NMP lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs). Many of the GENs are specific to environmental topics and are identified in Table 3.1, detailing how the works meet the requirements of a specific GEN of the NMP.

Table 3.1: Applicable Scottish National Marine Plan GENs

General Planning Principles	Requirements	ISB Maintenance Dredge Considerations
GEN 2: Economic Benefits	Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.	Maintenance dredging will continue to allow PoCF to support and facilitate offshore energy sector development, the cruise sector, and related economic growth.
GEN 3: Social Benefits	Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.	The aim of the proposed maintenance dredge works is to provide safe navigational access and maintain operations at the ISB. This will enable access for vessels serving the offshore wind industry and tourism sector, in turn facilitating economic growth in the area. Continued operations at the ISB will continue to provide local job creation and training opportunities, with associated social benefits.
GEN 4: Co-Existence	Proposals which enable coexistence with other development sectors and activities within the Scottish marine area are encouraged in planning and decision-making processes, when consistent with policies and objectives of the Plan.	The ISB can be considered a multi-user facility as it is currently used by a range of sectors including offshore renewable energy, oil and gas decommissioning services, subsea fabrication services, and the cruise sector. The maintenance dredge works will ensure this co-existence of multiple industries can continue within the ISB, supported by safe navigational access for all users.
GEN 5: Climate Change	Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.	The works will enable continued growth in the offshore renewable energy sector by facilitating safe navigational access to larger vessels required for offshore windfarm components, therefore supporting net zero targets where possible. The proposed maintenance works are considered small-scale in size and duration, and will not give rise to, or require mitigation for, any impacts relating to climate change.
GEN 6: Historic Environment	Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance.	The ISB sits within a natural deep-water harbour, used through both world wars as a naval base and has since grown to support industrial developments in the Highland region. Historical features include records of the Oil Rig Service Base within the ISB, and records of naval uses of the port (PastMap, 2024). The proposed maintenance dredge works are not anticipated to affect these heritage assets. Although there have been a number of recorded aircraft and vessel

General Planning Principles	Requirements	ISB Maintenance Dredge Considerations
		wrecks in the Cromarty Firth, most have been salvaged due to the value of the vessels and/or cargo, and to maintain safe navigation within the shipping channels. No records of residual wrecks were found within the dredge area.
GEN 8: Coastal Process and Flooding	Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding.	The proposed maintenance dredge campaign will take the ISB depths back to its design depth and will not change coastal processes or flooding risks.
GEN 9: Natural Heritage	Development and use of the marine environment must: (a) Comply with legal requirements for protected areas and protected species. (b) Not result in significant impact on the national status of Priority Marine Features. Protect and, where appropriate, enhance the health of the marine area.	No Priority Marine Features (PMFs) have been identified or are expected within the dredging works area as it has previously been surveyed and dredged. Mitigation is proposed in Table 5.1 for the PMF identified in the disposal ground. Designated sites in the local area have been identified in Section 4: Environmental Sensitivities and potential impacts to these sites are discussed in Section 5: Consideration of Potential Impacts. Designated Sites have also been considered in the HRA Screening Supporting Document which has been developed to support the licence application (Affric, 2024b). In summary the proposed works are highly unlikely to give rise to any noticeable impacts to any protected species or habitats.
GEN 10: Invasive Non-Native Species	Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.	The potential for introduction of non-native species with equipment brought in to complete the works is considered in Section 5: Consideration of Potential Impacts, and appropriate mitigation identified.
GEN 12: Water Quality and Resource	Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.	The development is within Water Framework Directive (WFD) Transitional Waterbody: Inner Cromarty Firth (Waterbody ID 200443). It is also approximately 1300m from the Cromarty Bay Shellfish Waters Protected Area (SWPA) (Marine Scotland, 2024). These considerations are discussed in Section 5: Consideration of

General Planning Principles	Requirements	ISB Maintenance Dredge Considerations
		Potential Impacts; in summary the development is highly unlikely to give rise to any significant deterioration of water quality.
GEN 13: Noise	Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.	No significant noise associated with the dredging is anticipated.
GEN 14: Air Quality	Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits.	The ISB is located outwith any Air Quality Management Area (Air Quality in Scotland, 2024). No significant effects on air quality from the proposed dredging works are predicted, as discussed in Section 5: Consideration of Potential Impacts.

4 Environmental Sensitivities

4.1 Ecology

4.1.1 Shellfish

The proposed dredge is approximately 1.3km from the Cromarty Bay classified SWPA, which is located on the opposite (south) bank of the Cromarty Firth at Udale Bay, on the Black Isle. The area is 6km long by a maximum of 2km wide, and approximately half of the area is intertidal, exposed at low tide. The substrate consists mainly of fine sand and mud material. This part of the Firth is sheltered from prevailing winds by the Black Isle but is very exposed to north and north-easterly winds, which produces a fetch that suspends a lot of fine material into the water column (SEPA, 2011).

There is an active shellfish farming site, Udale Bay (Cromarty Bay) site reference SS0147, within the centre of Udale Bay, approximately 4.5km east southeast of the proposed maintenance dredge works (Scotland's Aquaculture, 2024). The site is licensed for common mussel and native oyster, with the registered operator being Cromarty Mussels Ltd. There are also two inactive shellfish farming sites within Udale Bay, Cromarty Bay West (SS0830) and Cromarty Bay East (SS0834) (Scotland's Aquaculture, 2024).

Investigations into the feasibility of conducting native oyster restoration in the Cromarty Firth are ongoing (Mossy Earth, 2023). The area being considered is to the east of the ISB.

4.1.2 Fish

A number of tributaries of the Cromarty Firth are classified as Scottish Salmon Rivers, where salmon are present (Marine Scotland, 2024). The closest are the Newhall Burn, which outfalls across the Cromarty Firth and 2.75km southeast of the ISB, and the River Alness (also known as the Avern) which outfalls 5.2km west of the ISB, at Alness Point on the same side of the Cromarty Firth as the ISB. Located in the wider area are the River Conon and the River Sgitheach. Salmon from these rivers will pass through the Cromarty Firth and pass the ISB during migration to and from sea.

4.1.3 Benthic Ecology

The ISB has been recently and historically dredged and no PMFs have been recorded within 1km. The nearest PMF identified from NMPi (Marine Scotland, 2024) was located on the eastern shore of Balblair where seagrass beds have been recorded, approximately 1.05km south of the ISB. A horse mussel (*Modiolus modiolus*) bed has been identified from NMPi (Marine Scotland, 2024) partly within the southern section of the disposal ground recorded in 2017, see Table 4.1 for coordinates of the area. Evidence shows that horse mussels are likely able to tolerate acute increases in suspended sediment short-term and an intolerance of low has been recorded. Increases in suspended solids may provide an increase in food availability and therefore be beneficial. The species is adapted to a benthic sediment habitat and are therefore probably capable of rejecting excess silt or particulates in the water column and are consequently anticipated to recover immediately. Sensitivity to smothering was however, recorded as high with low recoverability anticipated (MarLIN, 2024).

Table: 4.1 Extent of Horse Mussel Bed within Sutors Disposal Ground

Corner of PMF within Disposal Ground	Latitude	Longitude
Northwest corner	57 41.100	3 59.640
Northeast corner	57 41.099	3 59.520
Southeast corner	57 41.039	3 59.460
Southwest corner	57 41.039	3 59.700

4.1.4 Marine Mammals

The Cromarty Firth is frequented by cetaceans and pinnipeds. As detailed in Table 4.2, the Moray Firth SAC (which includes bottlenose dolphins (*Tursiops truncatus*) as a qualifying feature) is located 6km east of the development. The SAC extends from the Moray Firth into the Cromarty Firth and encompasses the dredge disposal site (CR019). The Cromarty Firth designated non-breeding common seal (*Phoca vitulina*) haul out site is located approximately 9km southwest of the ISB, on the intertidal sandbanks between the Cromarty Bridge and the Storehouse of Foulis.

Bottlenose dolphin, harbour porpoise (*Phocoena Phocoena*), grey seal (*Halichoerus grypus*), and common seal have been recorded regularly in the waters adjacent to the ISB.

4.1.5 Invasive Non-Native Marine Species

The ISB lies within the Moray Firth Scottish Marine Region (SMR) classified as a 'Region of some concerns' for Invasive Non-Native Marine Species (INNMS) (Scottish Government, 2020). This SMR is known to contain the high-impact species common cordgrass (*Spartina anglica*).

4.1.6 Ornithology

As detailed in Table 4.2 there are multiple designated sites for birds in the vicinity of the works, these are considered in detail in the HRA Screening Supporting Report (Affric, 2024b). In addition, common and Arctic tern and, eider duck have been recorded breeding on the ISB, most recently recorded in 2024 (Swann and Brockway for RSPB, 2024).

4.1.7 Otter

Otter (*Lutra lutra*) are known to be in the vicinity of the ISB and are a qualifying feature of some designated sites in the region (see Table 4.2.1) which has been considered in the HRA Screening Supporting Report (Affric, 2024b). No resting places have ever been identified within the service base during previous surveys carried out for various development phases.

4.1.8 Designated Sites

Designated sites which are relevant to the proposed maintenance dredge of the ISB are shown in Table 4.2, alongside the associated qualifying interest(s).

Table: 4.2 Designated Sites Relevant to Proposed Works

European Site	Approximate Distance and Direction from the Works Site	Qualifying Interest(s)
Cromarty Firth Site of Special Scientific Interest (SSSI)	~300m north	Bar-tailed godwit (<i>Limosa lapponica</i>); Red-breasted merganser (<i>Mergus serrator</i>); Whooper swan (<i>Cygnus cygnus</i>); Redshank (<i>Tringa totanus</i>); Wigeon (<i>Anas penelope</i>); Mudflats; Saltmarsh; and Sandflats.
Cromarty Firth Special Protected Area (SPA)	~300m north	Osprey (<i>Pandion haliaetus</i>) (Breeding); Common tern (<i>Sterna hirundo</i>) (Breeding); Whooper swan (<i>Cygnus cygnus</i>); Bar-tailed godwit (<i>Limosa lapponica</i>); Greylag goose (<i>Anser anser</i>); Redshank (<i>Tringa totanus</i>); Curlew (<i>Numenius arquata</i>); Knot (<i>Calidris canutus</i>); Red-breasted merganser (<i>Mergus serrator</i>); Scaup (<i>Aythya marila</i>); Pintail (<i>Anas acuta</i>); Wigeon (<i>Anas Penelope</i>); Dunlin (<i>Calidris alpina</i>); Oystercatcher (<i>Haematopus ostralegus</i>); and Waterfowl assemblage.
Moray Firth Special Area of Conservation (SAC)	6km east	Bottlenose dolphin (<i>Tursiops truncatus</i>); and Subtidal sandbanks
Inner Moray Firth SPA	15km south south-west	Osprey (Breeding); Common tern (Breeding); Common goldeneye (<i>Bucephala clangula</i>); Cormorant (<i>Phalacrocorax carbo</i>); Goosander (<i>Mergus merganser</i>); Teal (<i>Anas crecca</i>); Bar-tailed godwit; Greylag goose; Red-breasted merganser; Redshank; Scaup; Curlew; Wigeon; Oystercatcher; and Waterbird assemblage.
Loch Eye SPA	16km northeast	Greylag goose; and Whooper swan.
Dornoch Firth and Loch Fleet SPA	16km north northeast	Bar-tailed godwit; Greylag goose; Wigeon;

European Site	Approximate Distance and Direction from the Works Site	Qualifying Interest(s)
		Curlew; Redshank; Dunlin; Oystercatcher; Osprey; Scaup; Teal; and Waterfowl assemblage.
Dornoch Firth and Morrich More SAC	16km north northeast	Harbour seal (<i>Phoca vitulina</i>); Otter (<i>Lutra lutra</i>); Atlantic salt meadows; Coastal dune heathland; Dune grassland; Dunes with juniper thickets; Estuaries; Grasswort and other annuals colonising mud and sand; Humid dune slacks; Intertidal mudflats and sandflats; Lime-deficient dune heathland with crowberry; Reefs; Shifting dunes; Shifting dunes with marram; and Subtidal sandbanks.
River Spey SAC	48km southeast	Sea lamprey (<i>Petromyzon marinus</i>); Atlantic salmon (<i>Salmo salar</i>); Freshwater pearl mussel (<i>Margaritifera margaritifera</i>); and Otter.

4.2 Water Quality

The ISB is within WFD Transitional Waterbody Inner Cromarty Firth (Waterbody ID 200442). At last classification in 2022 it was determined to be of overall good status (Scottish Environment Protection Agency (SEPA), 2024a), with high water quality status. The dredge disposal site (CR019) sits across the WFD Transitional Waterbody Outer Cromarty Firth (Waterbody ID 200442) and the Coastal Waterbody Hilton of Cadboll to Whiteness Head (Waterbody ID 200501), both of which have also been determined as good overall status. It is not anticipated that temporary siltation from dredge and disposal would affect this.

The closest classified Bathing Water is Rosemarkie, located 25km by sea to the southeast, which was categorised as good quality in the most recent assessment in 2023 (SEPA, 2024b). The location of the Bathing Water in relation to the ISB and the dredge spoil ground is such that it will not be affected by the works and will therefore not be considered further.

4.3 In-Air Noise

The ISB is located on the southern edge of the town of Invergordon where there are residential and commercial premises within 500m of the proposed works area.

4.4 Underwater Noise

The proposed maintenance dredging will be conducted at an industrial port with ongoing and frequent vessel movements. Dredging vessels are typically a source of low frequency, non-impulsive and continuous underwater noise. Underwater noise levels are not expected to be a major noise source and are not anticipated to impact upon marine mammals as noted in Section 4.1.4 or other aforementioned ecology.

4.5 Marine Navigation

Invergordon is an operational harbour with regular vessel movements however, movements are controlled by PoCF as the harbour authority, who operate in compliance with the Port Marine Safety Code.

5 Consideration of Potential Impacts

Potential impacts arising from maintenance dredging at the ISB are described in Table 5.1, along with identified mitigation where required. It should be noted that impacts on designated sites and their features have been fully considered within the HRA Screening Supporting Report and are therefore not specifically considered here (Affric, 2024b).

Table 5.1: Potential Impacts by Activity, Receptor and Proposed Mitigation

Activity	Receptor	Potential Impact	Mitigation Measures
Dredging Resulting in Increased Sediment Loading in the Water Column	Water quality	Material dropped into the sea during dredging will pass through the water column. The majority of sediment will drop through the water column quickly, hence any increases in sediment loading the water column and changes in turbidity will be short lived. This is, unlikely to have an impact on the status of the WFD Transitional Waterbody Inner Cromarty Firth (Waterbody ID 200442), or to affect larger ecological receptors. Increased turbidity could affect salmon smolts ability to migrate past the ISB and reach the Moray Firth.	<ul style="list-style-type: none"> The works are planned outwith the salmon smolt run period (May) to avoid potential impacts.
	Marine Mammals		
	Fish		
	Ornithology		
	Otter		
Remobilisation and Spread of Contaminated Materials	Marine Mammals	A sample taken from Berth 3 showed high levels of Polyaromatic Hydrocarbons. The remobilisation and disposal of contaminated materials can result in negative impacts to ecology. Toxins can cause physiological changes and bioaccumulation which can be spread through the food chain.	<ul style="list-style-type: none"> Dredging will not be carried out along berths 2, 3 and 4 where contamination has been identified at one sample point between berths 3 and 4. Further sampling will be carried out between Berths 2 and 4 to understand the extent of the contamination. This will inform a BPEO and future licencing as required.
	Benthic Ecology		
	Fish		

Activity	Receptor	Potential Impact	Mitigation Measures
	Ornithology		
	Otter		
Collision of Dredge Vessel or Associated Marine Plant with an Ecological Receptor	Marine Mammals	A vessel collision with an ecological receptor could result in injury or death however, the dredge vessel will be operating in an area very close to the berths where, as noted, it is unlikely marine mammals will be in proximity. The dredge vessel will be moving slowly and therefore physical injury to marine mammals is highly unlikely. The works are in an area with regular vessel movement. It is therefore not expected that the works will cause disturbance. Similarly, the location of the works and the fact that vessels are normally in this area, means that disturbance to birds and otter is unlikely.	<ul style="list-style-type: none"> It is not proposed that any formal Marine Mammal Observation (MMO) is required during dredging due to the unlikelihood of marine mammals being immediately within the dredge area. However, the dredge vessel crew will be advised to watch out for marine mammals to ensure that they do not interact with them. The dredge vessel crew will be provided with a toolbox talk and ID guide prior to beginning works. The works are planned outwith the salmon smolt run period (May).
	Fish		
	Ornithology		
	Otter		
Falling Material During Disposal of Dredge Spoil	Marine Mammals	Material deposited at sea will be primarily made up of silts, there is the potential to increase sedimentation in the water column. Increased sedimentation could impact on the foraging success of the receptors. Although the material to be dredged is predominantly silt and does not drop out as quickly as materials with high sand/gravel content, the waters within the disposal site are already high in silt content and turbidity can increase due to natural fluctuations	<ul style="list-style-type: none"> A Spoil Disposal Marine Mammal Protocol will be implemented where marine mammal observations and/or passive acoustic monitoring should be carried out by trained personnel prior to disposal. See Appendix 1: Spoil Disposal Marine Mammal Protocol for full details. Existing licensed spoil site 'Sutors' will be used, as per previous dredging campaigns.
	Ornithology		
	Otter		

Activity	Receptor	Potential Impact	Mitigation Measures
	Fish	in the water environment. As such, any increases will be short-lived and should not impair the foraging success of receptors.	<ul style="list-style-type: none"> • A split-hopper or equivalent bottom-opening vessel will be used, a low energy process which encourages material to drop promptly to the seabed. • The horse mussel bed within the disposal ground to the south, and immediate surrounding area, will be avoided to prevent smothering of this habitat.
	Benthic Ecology	<p>Material deposited at sea will, however, have the potential to injure marine mammals should they be immediately under the vessel at the time of disposal.</p> <p>Falling material which may settle on benthic ecology has the potential to smother organisms.</p>	
Operations and Movement of Vessels	Invasive Non-Native Marine Species (INNMS)	<p>The use of equipment which has been used in other ports has the potential to transfer INNMS from one port to another.</p> <p>The introduction of INNMS has the potential to cause ecological impacts. This in turn can result in major costs due to the difficulty in trying to eradicate a species once introduced.</p>	<ul style="list-style-type: none"> • Equipment mobilised to conduct dredging works will be inspected to ensure it is free from soilage and/or marine material. • Appropriate steps will be taken to ensure that the equipment is cleared of material and allowed to dry out prior to its next deployment. • All vessels utilising the ISB are expected to be compliant with the relevant requirements of the International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 and where appropriate follow Guidelines for the Control and Management of Ships Biofouling to Minimize the Transfer of Invasive Aquatic Species (Marine Environment Protection Committee, 2023).

Activity	Receptor	Potential Impact	Mitigation Measures
	Marine Navigation	The dredge vessel will be moving in the operational port which could give rise to an increase in collision risk or impede the movement of other port users.	<ul style="list-style-type: none"> All vessels operating in the area will be under direction of the PoCF Harbour Master to ensure the operational area is clear of vessels during works. There will be clear communications channels (VHF Radio and telephone) established to ensure the dredge vessel and port control have adequate communications in place at all times. Dredge vessels will adhere to a fixed route, speed and direction when arriving and leaving the port. A Notice to Mariners will be issued in advance of the works.
	In-Air Noise	Noise from the vessel operating and conducting dredging may cause noise disturbance to residents and local businesses.	<ul style="list-style-type: none"> Plant will be shut down between work periods or throttled down to a minimum. Regular maintenance of all equipment used on site will be conducted, including maintenance related to noise emissions. Where practicable works closest to residential properties i.e. the West Harbour, will be completed during daylight hours.
Loss of Containment of Fuels, Oils or Hazardous Materials	Water Quality	The dredge vessel will use fuel oil and may have hydraulic fluids or other hazardous materials on board. In event of an incident, there is a risk that these could be released to the marine environment and impact water quality with knock on ecological implications for ecological receptors such as fish, otter and marine mammal species if not dealt with promptly.	<ul style="list-style-type: none"> Appropriate maintenance will be conducted on the dredge vessel to minimise the risk of leaks. Bunded fuel, oil and chemical storage will be provided, and will be locked when not in use. Refuelling will be conducted by trained operatives following harbour bunkering procedures.
	Fish		
	Marine Mammals		

Activity	Receptor	Potential Impact	Mitigation Measures
	Ornithology		<ul style="list-style-type: none"> The contractor will be required to align to the PoCF spill plans and spill kits will be in place with operatives trained in their use. The PoCF spill response procedures would be implemented in event of a significant incident.
	Otter		

6 Summary

It is proposed maintenance works be undertaken across the ISB including the Queen's Dock, berths 1, 5 and 6, the West Harbour and Saltburn Pier. The BPEO has concluded that a combination of plough dredging and, dredge and disposal using backhoe and cutter suction methods should be employed in this instance (Affric 2024a), in order to maintain the ISB's operational depths.

Potential issues associated with the works have been identified and evaluated, and it is considered that the work will have no significant effects to the marine environment due to the localised nature of the proposals and relatively short duration of works each year. Appropriate mitigation is proposed to minimise potential negative effects on stakeholders and the environment.

Potential effects on European Designated sites have been considered within the HRA Screening Supporting Document (Affric, 2024b). After consideration of the proposed works and the anticipated risks to qualifying interests associated with European Sites, it was determined that the only potential LSE for the proposed dredging works, was the risk of accidental physical injury to bottlenose dolphin associated with the Moray Firth SAC, during the disposal of dredge material at the Sutors. A Spoil Disposal Marine Mammal Protocol has therefore been produced, adapted from JNNC guidance, which details mitigation measures to be implemented during the disposal of dredged material. With the implementation of the proposed mitigation measures within the marine mammal protocol, it is not anticipated that there will any residual adverse effects to bottlenose dolphin as a qualifying interest of the Moray Firth SAC however an Appropriate Assessment is likely to be carried out by the competent authority, Marine Directorate, in consultation with NatureScot.

National Marine Plan policies have been considered, and the proposed maintenance dredge works are in alignment with both general and relevant specific policies. The award of a marine dredge licence will allow for the continued operations of the ISB and facilitate the use of the berths by the offshore wind sector, supporting Scotland in its efforts towards achieving net zero.

7 References

- Affric, 2024a. Port of Cromarty Firth Maintenance Dredge Licence Best Practicable Environmental Option Report. Report No. 129_REP_03.
- Affric, 2024b. Port of Cromarty Firth Habitat Regulations Appraisal Supporting Document. Report no. 129_REP_02.
- Marine Environment Protection Committee, 2023. 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species. Available at: <https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.378%2880%29.pdf>.
- Marine Scotland, 2024. National Marine Plan Interactive: Maps. Available at: <https://marinescotland.atkinsgeospatial.com/nmpi/>.
- MarLIN, 2024. The Marine Life Information Network. <https://www.marlin.ac.uk/species/detail/1532>
- Mossy Earth, 2023. Native Oyster Restoration. Available at: <https://www.mossy.earth/projects/native-oyster-restoration>.
- PastMap, 2024. PastMap: Exploring Scotland's Historic Environment. Available at: <https://www.pastmap.org.uk/map>.
- Scottish Government, 2015. Scotland's National Marine Plan. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2015/03/scotlands-national-marine-plan/documents/00475466-pdf/00475466-pdf/govscot%3Adocument/00475466.pdf>.
- Scottish Government, 2020. Marine Scotland Assessment: Non-Native Species. Available at https://marine.gov.scot/sma/sites/default/files/sma2020_-_non-native_species_-_healthy_and_biologically_diverse.pdf.
- Scotland's Aquaculture, 2024. Scotland's Aquaculture Map: Active Shellfish Sites – Udale Bay. Available at: https://aquaculture.scotland.gov.uk/data/site_details_record.aspx?site_id=SS0147.
- SEPA, 2011. Shellfish Growing Waters: Cromarty Bay. Available at: <https://www2.sepa.org.uk/shellfish/pdf/17.pdf>.
- SEPA, 2024a. Water Framework Directive Water Classification Hub. Available at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/>.
- SEPA, 2024b. Bathing Water Data. Available at: <https://bathingwaters.sepa.scot/locations/results/?location=206238>.
- Swann and Brockway, 2024. Invergordon Port: Eider and Tern Survey 2024.

8 Glossary

Acronym	Definition
BPEO	Best Practicable Environmental Option
CD	Chart Datum
GEN	General Planning Principle
HRA	Habitats Regulation Assessment
INNMS	Invasive Non-Native Marine Species
ID	Identification
INNMS	Invasive Non-Native Marine Species
ISB	Invergordon Service Base
km	kilometres
LSE	Likely Significant Effect
m	metres
MMO	Marine Mammal Observers
NMP	National Marine Plan
NMPi	National Marine Plan Interactive
PAM	Passive Acoustic Monitoring
PMF	Priority Marine Feature
PoCF	Port of Cromarty Firth
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SEPA	Scottish Environment Protection Agency
SMR	Scottish Marine Region
SPA	Special Protected Area
SSSI	Sites of Special Scientific Interest
SWPA	Shellfish Water Protected Area
WFD	Water Framework Directive

Appendix 1: Spoil Disposal Marine Mammal Protocol

General Provisions

All marine mammal observers (MMOs) and passive acoustic monitoring (PAM) technicians will be trained to Joint Nature Conservation Committee (JNCC) standards. Both MMOs and PAM technicians shall have the power to delay disposals should marine mammals be present in the mitigation zone. The mitigation zone for spoil disposals shall extend 200m from the disposal vessel.

A formal log shall be maintained by the MMOs and PAM technicians whether marine mammals are present or not. The forms used will be the standard JNCC MMO forms, modified to suit spoil disposal operations. All data will be stored electronically and provided to Marine Directorate with the licence return. The details recorded will include but are not limited to:

- Time and location of the disposal operations;
- Mobilisation and demobilisation times of MMO/PAM team;
- Start time of disposal;
- Duration of disposal;
- Conditions affecting observations including sea state and visibility, throughout surveillance;
- Records of any sightings/acoustic detections and actions taken;
- Records will also be kept of sightings of other marine species including otters.

Visual MMO watches will be conducted during daylight hours, when sea state is ≤ 3 , and when visibility permits (clear visibility past the spoil ground for land-based observations, and ≥ 300 m for vessel based). Unless PAM is available, spoil disposal operations will not take place during hours of darkness, or if conditions are unsuitable for visual observations.

If available, PAM will be used during hours of darkness, when sea state is ≥ 4 , or if visibility prohibits visual observation. Summaries of both visual and acoustic observation protocols are provided below.

It is vital that sufficient advance notice is provided for MMO call out, to allow for early check on sea state and visibility at the Spoil Ground, so that PAM operators may be called out in time to conduct 30-minute PAM survey prior to vessel arrival at the Spoil Ground if conditions require.

Visual Observation Protocols

Visual marine mammal observations will generally be conducted by an MMO at set observation locations at either North or South Sutor. Directions to the shore observation points are found attached below. The MMO may also be based on the disposal vessel or separate observation vessel if required. The following protocol will be followed regardless of the MMO location:

1. The MMO should be informed by the dredger via VHF radio or phone once dredging is complete and that the ship is enroute to the spoil ground. The vessel must give suitable warning to the MMO observer to allow them to get into position and start a watch at least 20 minutes before the anticipated arrival time.

2. The MMO will commence the watch using binoculars (minimum characteristics of 8x42) so that at least a 20-minute watch has been conducted by the time the ship reaches the spoil ground. The MMO should focus their effort on the spoil ground and advise the ship if marine mammals are present in order to avoid them if possible.
3. Once in the spoil ground the ships officers will ask the MMO if they are clear to commence the disposal. If the 200m mitigation zone is clear, then MMO will give permission to proceed. If marine mammals are present within the mitigation zone, disposal will be delayed until the marine mammals have left the mitigation zone and 5 minutes have passed since an animal was last sighted within the zone.
4. Visibility Limits:
 - Shore based – Must have clear visibility past the Spoil Ground, sufficient light (i.e. daylight hours), and sea state must be ≤ 3 .
 - Vessel based – Must have clear visibility to 300m from the disposal vessel, sufficient light (i.e. daylight hours) and sea state must be ≤ 3 .

A simple flow chart summarising the daytime MMO protocols is provided in Figure 1.

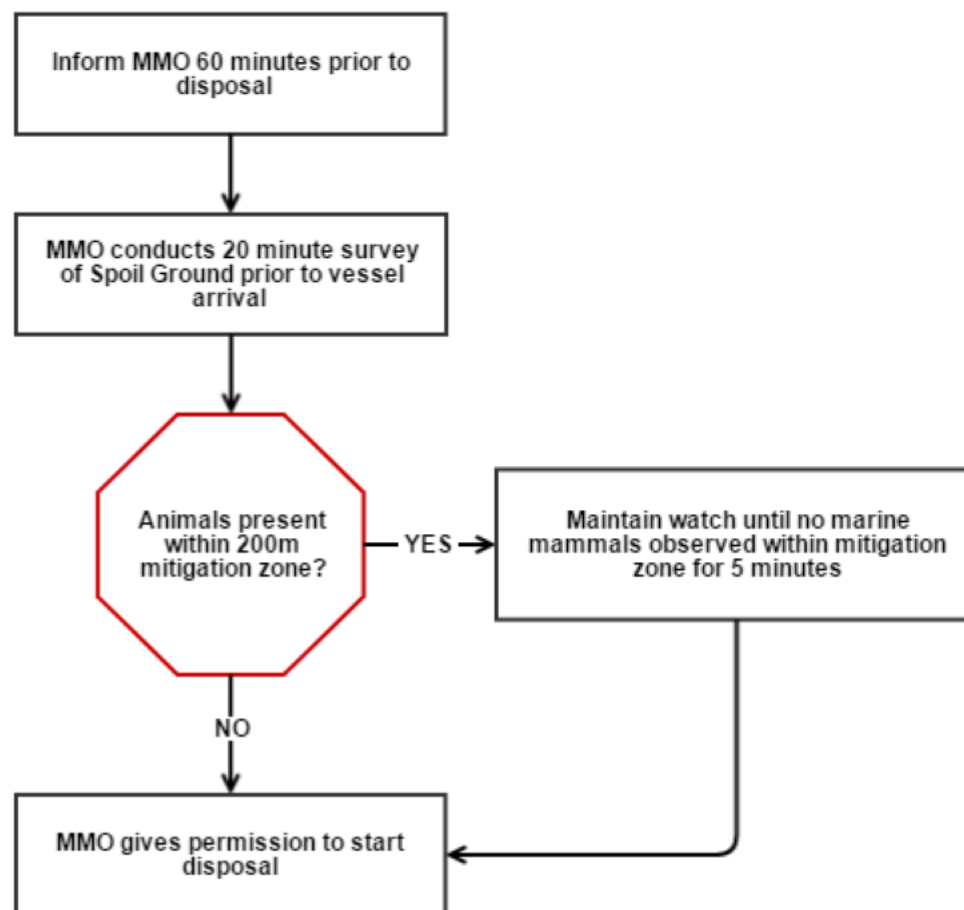


Figure 1: Flowchart of spoil disposal MMO protocol.

Acoustic Monitoring Protocols

During hours of darkness, sea states ≥ 4 , or if visibility falls to below 300m for vessel-based observation or visibility is not clear past the spoil ground for shore-based observation, marine mammal detection will be conducted acoustically using Passive Acoustic Monitoring (PAM). This system will be able to detect vocalising harbour porpoises to a range of up to 300m and bottlenose dolphins to a range of up to 2km. The PAM system will be deployed in a location where the detection ranges outlined above provide sufficient coverage of the spoil ground to allow detection of vocalising cetaceans in the area. The following protocol will be used for PAM:

1. The PAM technician shall be given a minimum warning of 60 minutes ahead of the intended disposal time, in order to prepare for the watch. VHF radio or phone contact will inform the PAM operator when the vessel is enroute. The operator will work from the PAM base station where the laptop will receive the signal from the PAM buoy.
2. The PAM technician should perform a minimum of a 30-minute watch before the vessel reaches the Spoil Ground.
3. Once the PAM technician is satisfied no marine mammals are present within the 200m mitigation zone, they may advise the crew to commence the disposal. If mammals are detected within the zone, the disposal will be delayed until 10 minutes have passed since last detection within the zone.

A simple flow chart summarising the PAM protocols is provided in Figure 2.

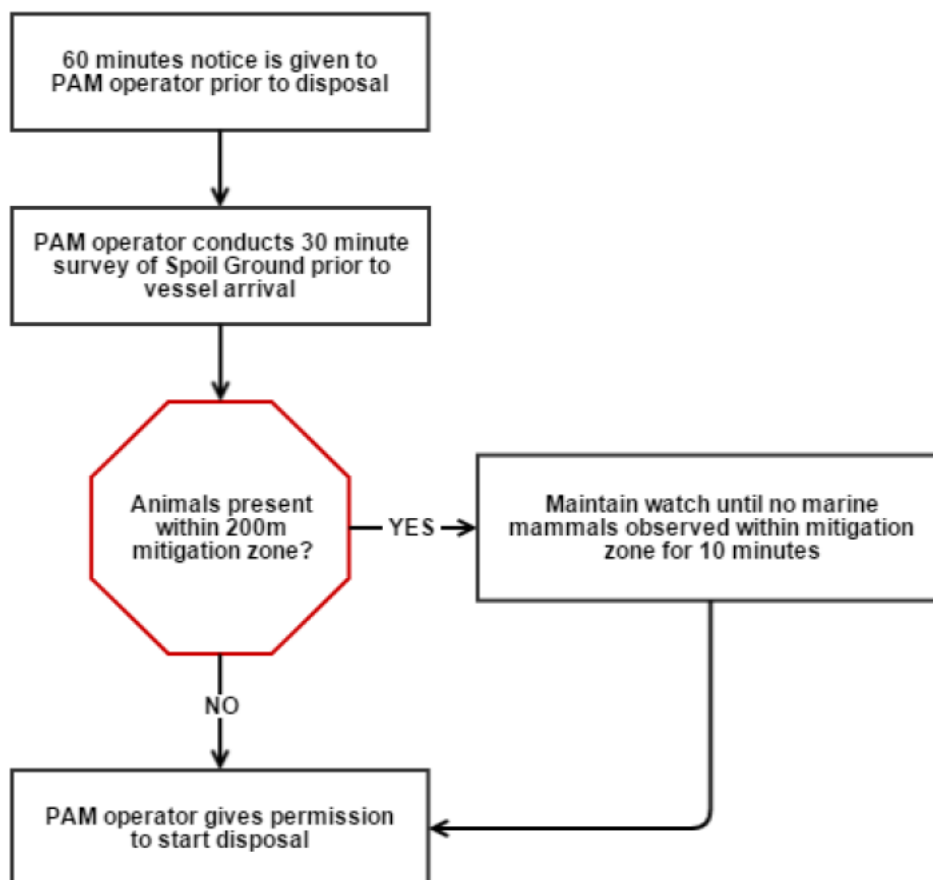




Figure 2: Flowchart of spoil disposal PAM protocol.

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Legend

-  Dredge Boundary
-  Dredge Boundary Points

