Best Practicable Environmental Option Assessment

Aberdeen South Harbour Maintenance Dredging

May 2022

HARRIS HOLDEN

Contents

Appendices

Document history

Version	Date	Notes
AHB-BPEO-ASH-R1	7 April 2022	Draft issued for review
AHB-BPEO-ASH-R2	22 April 2022	Final issue
AHB-BPEO-ASH-R3	20 May 2022	Section 2.2.2 updated following MS-LOT comments

1. Introduction

Aberdeen Harbour is the major port serving the North-East of Scotland. There are approximately 8,000 vessel arrivals and 5 million tonnes of cargo handled each year, with the harbour supporting 10,000 full time equivalent jobs. It is also the mainland port for the lifeline service to the Northern Isles and as well as general cargo and passengers. Aberdeen is the largest support harbour for the North Sea Energy Industry.

As a statutory harbour authority, Aberdeen Harbour Board (AHB) is required to carry out maintenance dredging of navigation channels and berths to maintain safe navigable depths and support customers' business needs. The Aberdeen Harbour Revision Order 2016 gives AHB powers to dredge within its statutory harbour limits.

During 2017 – 2022, the Aberdeen South Harbour has been under construction in Nigg Bay. It will become an operational harbour in October 2022, and limited operations are likely to commence on the East Quay in June/July 2022.

This report presents the Best Practicable Environmental Option (BPEO) assessment for maintenance dredged material from Aberdeen South Harbour, to support an application to Marine Scotland – Licensing Operations Team (MS-LOT) to deposit dredged material at sea. This BPEO is specific to maintenance dredging and associated disposal in the South Harbour. From 2023, AHB intends to submit a single marine licence application for all dredging within Aberdeen Harbour.

BPEO assessment is a method for identifying the option that provides the *most environmental benefit* or *least environmental damage*. It assesses the performance of different options using a range of criteria such as environmental impact, technical feasibility and cost.

2. Description of dredging activity and dredged material

2.1. Dredging activity

Prior to the opening of Aberdeen South Harbour, a maintenance dredge is required to remove material that has accumulated since the capital dredging was completed in 2021, reinstating the depths of 10.5 m below Chart Datum (CD) at the East Quay and entrance channel, and 9.0 m below CD across the rest of the harbour. At the East Quay and entrance channel, material will be dredged using a trailer suction hopper or a backhoe. In the rest of the harbour, material will be ploughed from shallower areas into adjacent deeper water. *Figure 1* shows the dredge areas and volumes.

This BPEO considers the material to be dredged using a trailer suction hopper or a backhoe. For plough dredging, there is no ‘disposal’ so a BPEO is not required.

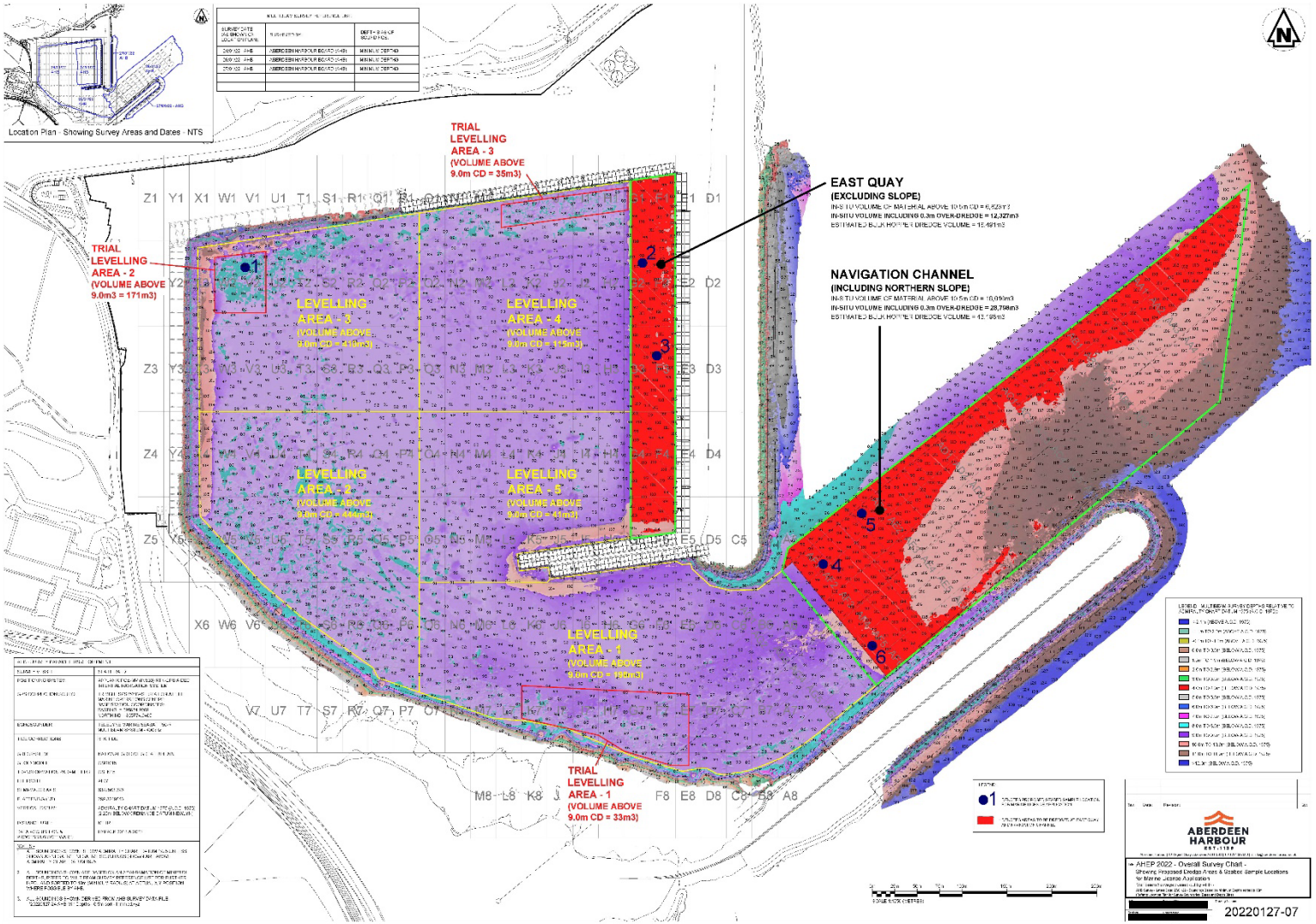

Figure 1 Areas to be dredged

2.2. *Material to be dredged*

2.2.1. Physical characteristics

In March 2022, six surface sediment samples were collected from the areas to be dredged as agreed with MS-LOT – sample locations are shown on *Figure 1*. Sample analysis reveals that the dredged material is predominantly silt (average 67%) with some sand (average 33%). Full sampling results are provided in Appendix A.

Sample 1 contains a significantly higher proportion of gravel than the other samples (68%) but as the volume to be dredged from this area is very small (less than 500 m^3) and will be ploughed, it is not representative of the material to be 'disposed' so is excluded from the averages provided above.

2.2.2. Chemical characteristics

The chemical analysis of sediment samples has been compared to the Marine Scotland Revised Action Levels, which are used to determine the contaminant loading of the material and its suitability for deposition at sea. The full results are provided in Appendix A.

For heavy metals, there is one marginal exceedance of Action Level 1 for cadmium in sample 4, and minor exceedances of Action Level 1 for copper in samples 2 and 3, as shown in *Table 1*. In all cases Action Level 1 was only marginally exceeded. All other results were below Action Level 1. As shown in the 'PR Details' sheet in Appendix A, the average wet weight concentration from all six samples is below Action Level 1 for all heavy metals.

Sample Number	**Analysis results**	
	Cadmium [Action Level 1 = 0.4 mg/kg]	**Copper** [Action Level 1 = 30 mg/kg]
AHB02	*Below AL1*	37.7 mg/kg
AHB03	*Below AL1*	34.2 mg/kg
AHB04	0.41 mg/kg	*Below AL1*

Table 1 Exceedences of Action Level 1 for heavy metals

For polycyclic aromatic hydrocarbons (PAHs), there were minor exceedances of Action Level 1 in samples 2, 3 and 6. Total hydrocarbons exceeded Action Level 1 in four of the six samples. As shown in the 'PR Details' sheet in Appendix A, the average wet weight concentration from all six samples is below Action Level 1 for all PAHs, and only marginally exceeds Action Level 1 for total hydrocarbons.

There were no exceedances of Action Level 1 for organotins or polychlorinated biphenyls.

These sampling results are comparable to (and in many instances lower than) sampling results taken over many years to support maintenance dredging in the North Harbour and deposition at the sea deposit site Aberdeen CR110, including the most recent samples taken from the North Harbour in 2020. Material from the North Harbour has been consistently deemed by

MS-LOT to be suitable for deposition at sea, so the material from the South Harbour is therefore also deemed suitable for deposition at sea.

3. Scoping of potential options

This section describes potential options for the dredged material. Where an option is not considered feasible, the reason is given and it is not taken forward to the assessment stage. Options that are considered practicable are considered in detail in Section 4.

3.1. Option 1: Landfill

The most common use of dredged material within landfill sites is as capping or restoration material. Material would need to be brought ashore within the port estate and dewatered before being transported to trucks and taken by road to a landfill site. Suitable land for drying lagoons is not available within the port estate.

There are no suitable landfill sites in the immediate vicinity of Aberdeen Harbour that could cope with a relatively large quantity of material on an annual basis. The closest operational landfill site to Aberdeen Harbour that is authorised by the Scottish Environment Protection Agency (SEPA) is Loch Hills Quarry in Dyce, approximately 15 km to the north by road from Aberdeen South Harbour (SEPA, 2022).

Existing landfill sites must cope with large volumes of domestic and industrial requirements, and marine dredgings on the present scale would place an intolerable burden on such sites. Dredged material is relatively inert by landfill standards, so disposal at a landfill site is not usually necessary or recommended unless it is significantly contaminated, which it is not in this case (see Section 2.2.2).

Transportation of material from the harbour to a landfill site would generate significant vehicle movements on local roads, contributing to traffic congestion and air and noise pollution.

This option has been discounted.

3.2. Option 2: Deposition at sea

The dredged material meets the chemical requirements for deposition at sea (see Section 2.2.2).

Deposit sites in the marine environment are designated by MS-LOT. The closest licensed sea deposit site to Aberdeen Harbour is CR110 (Aberdeen), approximately 20 minutes' sailing time from the harbour. Dredged material from Aberdeen North Harbour has been deposited at this site for at least 80 years.

The nature of the dredged material and the proximity of a suitable licensed site makes deposition at sea a viable option, and it is explored in more detail in Section 4.

3.3. Option 3: Agriculture use

The north-east of Scotland is a rural farming area with an abundance of good arable land and there is no known requirement for a supply of imported material. The dredged material would have to be de-watered and desalinated to make it suitable for soil conditioning or spreading, and no land is available within the port estate to locate a drying lagoon.

This option has been discounted.

3.4. Option 4: Use in land reclamation

Dredged material can be suitable for land reclamation. The material grade and quality are critical: material suitable for reclamation is generally medium to coarse sands and gravel fractions, typically in large volumes. The material to be dredged from the South Harbour is predominantly silt with some sand (see Section 2.2.1) so is unlikely to be suitable for land reclamation.

Furthermore, no land reclamation projects have been identified within Aberdeen or the locality which require dredged material for land reclamation purposes. The construction of the South Harbour will be largely complete by the time the maintenance dredging is carried out (June 2022) and there will be no requirement for reclamation material.

This option is discounted for the 2022 marine licence application; however, it will be kept under review in future revisions of the BPEO should there be a local need that aligns with the timescale required for maintenance dredging.

3.5. Option 5: Use as construction material

The saline content of the dredged material makes it unsuitable as a construction material. The grading and washing required coupled with the drying and storage challenges previously identified makes this option uneconomical and unpractical.

This option has been discounted.

3.6. Option 6: Beach recharge

The use of dredged material for beach recharge is a sustainable beneficial use: it generates a purpose for the material that benefits a local amenity. Material can be deposited direct from the dredging vessel via a pipeline or by ‘rainbowing’ onto the beach, where it is reprofiled using land-based plant.

This option is considered feasible and is explored in more detail in Section 4.

3.1. Summary of options scoping

The scoping of potential options concludes that options 1 (landfill), 3 (agricultural use), 4 (use in land reclamation) and 5 (use as construction material) are not viable for the reasons described above. The following options will be taken forward to assessment:

- Deposition at sea
- Beach recharge

4. Assessment of options

In this section, deposition at sea and beach recharge are assessed further for strategic, environmental and financial considerations.

4.1. Assessment methodology

MS-LOT's general licensing guidance (MS-LOT, 2015) states the following in relation to BPEO assessment: *'consideration must be given to the availability of practical alternatives when considering any applications involving disposal of material at sea. In order for MS-LOT to assess the available alternative options, all sea disposal licence applications must be supported by a detailed assessment of the alternative options. This should include a statement setting out the reasons, including financial, that have led to the conclusion that deposit of the materials at sea is the BPEO*.'

There is no formal guidance available in Scotland on BPEO assessment for disposal of dredged material. This BPEO adopts an approach that considers three aspects: strategic, environmental and financial. The strategic and environmental considerations for each option are described in Sections 4.2 and 4.3, and an evaluation of the relative operating costs of each option is provided in Section 4.4. Section 5 then summarises the option assessment and concludes the BPEO.

4.2. Deposition at sea

4.2.1. Strategic considerations

Operational considerations

The operational practicalities of depositing dredged material at a licensed sea deposit site are straightforward: a split hopper barge would discharge material directly at the deposit site. No preparation of the material is required prior to deposition.

Availability of suitable sites

Dredging and deposition at sea has been carried out at Aberdeen Harbour throughout its history. For the past 80 years at least, material dredged from the North Harbour has been deposited at the same offshore site used solely by AHB: Aberdeen CR110.

Legislative implications

AHB has powers to dredge under the Aberdeen Harbour Revision Order 2016, provided that the activity is approved by the Scottish Ministers. A marine licence is required from MS-LOT to deposit material at sea.

Section 34 of the Environmental Protection Act 1990 (as amended) makes it a duty to take all measures available as are reasonable in the circumstances to apply the waste hierarchy set

out in Article 4(1) of the Waste Directive. The waste hierarchy ranks waste management options according to the best environmental outcome taking into consideration the lifecycle of the material. In its simplest form, the waste hierarchy gives top priority to preventing waste. When waste is created, it gives priority to reuse, then recycling, then other recovery, and last of all disposal. The option to deposit the dredged material at sea ranks poorly on the waste hierarchy as it is classed as disposal.

4.2.2. Environmental considerations

Safety implications

Deposition at sea has negligible implications for safety providing that standard navigation and maritime safety procedures are observed.

Public health implications

There are no threats to public health associated with deposition of uncontaminated dredged material at sea.

Local Acceptability

There are no anticipated local acceptability issues associated with the continuation of a long-standing method of disposing of dredged material. AHB has never received a complaint or enquiry from a member of the public regarding deposition at sea of maintenance dredged material from the North Harbour. AHB is unaware of any objections received by MS-LOT from members of the public relating to previous marine licence applications.

Pollution/contamination implications

As described in Section 2.2.2, the material to be dredged is considered to be suitable for deposition at sea according to the Marine Scotland Revised Action Levels, so the risk of pollution/contamination of the marine environment is very low.

Interference with other legitimate interests

The Aberdeen deposit site is located in open water outwith shipping channels. There is the potential for interference between the dredging vessel and other users of the sea (e.g. fishing or recreational vessels), which can be managed through compliance with harbour byelaws and standard communications between the dredging crew, AHB and other users. The risk of interference with other legitimate interests is low.

Amenity/aesthetic implications

There are no amenity or aesthetic implications of depositing material at a designated offshore site.

Ecological Implications

Deposition at sea can smother marine life on the seabed within the site. As the Aberdeen site has been in use for many years and is subject to annual deposition of material from the North Harbour, it is likely that any benthic species in and around the site can tolerate the periodic disturbance caused by deposition and temporary increases in turbidity.

A dedicated Marine Mammal Observer (MMO) watch will be kept by a nominated crew member aboard the dredger, following the general guidance for and acting in the role of a MMO, to ensure that marine mammals are not in the vicinity when deposition takes place.

4.3. Beach recharge

4.3.1. Strategic considerations

Operational considerations

Beach recharge (sometimes called beach nourishment) requires clean, sandy material. The dredged material is predominantly silt with some sand (see Section 2.2.1) so is unlikely to be suitable.

The material will be dredged using a trailer suction hopper dredger or backhoe dredger. As the material has to be deposited on an exposed open beach, these types of dredger could not sail close to the beach and strong pipelines through the breaker zone would be required to deposit sand on the beach. Once ashore, the material would typically be stockpiled in a bund and recovered and spread during low water.

Availability of suitable sites

AHB contacts Aberdeen City Council (ACC) and Aberdeenshire Council annually to enquire whether there are any opportunities for using dredged material for beach recharge or other projects. Aberdeenshire Council has no plans for beach recharge works (see correspondence in Appendix B). ACC is currently undertaking studies into coastal management solutions at Aberdeen Beach, but there is no definite project at this time, so any requirement for material will not be within the duration of the proposed marine licence (2022). AHB will continue to liaise with ACC and Aberdeenshire Council, and if a project materialises that could make use of the dredged material, it will be considered in a future revision of the BPEO.

Legislative implications

Standing advice from SEPA states that waste material, which includes dredged material, deposited above the low water mark is subject to Waste Management Licensing controls regulated by SEPA unless it is subject to a licence issued under Part 4 of the Marine (Scotland) Act 2010, in which case it is excluded from such controls (SEPA, 2016), provided that it does not constitute a landfill. As beach recharge would require a marine licence, it is assumed that a separate Waste Management Licence would not be required.

The option to reuse the dredged material for beach recharge ranks favourably on the waste hierarchy; it negates the need to otherwise dispose of the material.

Dredged material to be used for beach recharge requires a licence from the Crown Estate Scotland, and a royalty is payable for use of the material.

4.3.2. Environmental considerations

Safety implications

The use of a floating pipeline presents a potential hazard to navigation which would require marking and lighting in accordance with standard industry practices.

Pumping or rainbowing material onto the beach and subsequent reprofiling may present a hazard to beach users. It would be necessary to cordon off areas of the beach during the recharge operation.

Public health implications

As described in Section 2.2.2, the material to be dredged is considered to be suitable for deposition at sea according to the Marine Scotland Revised Action Levels, so the use of the material on the beach is highly unlikely to present issues for public health.

Pollution/contamination implications

As described in Section 2.2.2, the material to be dredged is considered to be suitable for deposition at sea according to the Marine Scotland Revised Action Levels, so the risk of pollution/contamination of the beach environment is very low.

Interference with other legitimate interests / Amenity implications

As described above, during the beach recharge operation it will be necessary to restrict access to areas of Aberdeen Beach and the inshore waters around the dredger. The dredging is proposed in the summer months when the beach is a popular local destination.

This is unlikely to be a significant concern due to the short term nature of the operation.

Ecological Implications

There are no significant ecological issues associated with using dredged material for beach recharge. It is preferable for the source material to match the existing beach material: the material to be dredged is predominantly silt with some sand (see Section 2.2.1).

4.4. Operational cost evaluation

Table 2 and Table 3 present estimates of the relative operating costs of deposition at sea and beach recharge for 100,000 m^3 of dredged material, based on AHB's own experience of the UK dredging industry. Dredging costs can vary considerably year-to-year depending on dredger availability, fuel prices and other factors.

Table 2 Estimated cost of sea deposit of 100,000 m^3

Dredger Mobilisation	£50,000
Dredger Costs @ £2.50/m^3	£250,000
TOTAL	£300,000

Table 3 Estimated cost of dredging 100,000 m^3 of material, of which 20,000 m^3 is suitable for beach recharge[1]

Lag Pipeline	£400,000
Dismantle Pipeline	£100,000
Hire of Plant	£50,000
Pumping Costs @ £1/m^3	£20,000
Dredger Mobilisation	£50,000
Dredge Costs @ £2.50/m^3	£250,000
TOTAL	£870,000

[Excludes royalty payable to The Crown Estate Scotland if dredged material were to be used for beach recharge]

[1] 20% is a reasonable assumption considering the average suitable sand content is 33%, not all of which could be extracted/separated from silts during the dredging process.

5. Best practicable environmental option

Two potential options are considered in the assessment: deposition at sea and beach recharge.

Operationally, both options are technically practicable but deposition at sea is the preferred option as it is a simpler and more efficient operation, maintains the maximum flexibility in terms of dredging equipment that can be used, and utilises an existing licensed sea deposit site (Aberdeen CR110). In any event, a suitable beach recharge site a fundamental requirement, and discussions with ACC and Aberdeenshire Council have confirmed that they have no requirement for material within the timeframe of the proposed maintenance dredging in 2022.

Environmentally, beach recharge is the preferred option according to the waste hierarchy as it uses a material that would otherwise be disposed; however, neither option is likely to cause significant adverse environmental impacts. Neither option would cause significant safety, public health, amenity or pollution/contamination issues.

Financially, the costs are almost three times greater for beach recharge than for deposition at sea.

Considering all three aspects, deposition of material at sea at Aberdeen CR110 is considered to be the BPEO.

ACC is currently undertaking studies into coastal management solutions at Aberdeen Beach, but there is no definite project at this time, so any requirement for dredged material will not be within the duration of the proposed marine licence (2022). If such a project materialises it will be considered in a future revision of this BPEO.

6. References

MS-LOT (2015). Marine Scotland Guidance for Marine Licence Applicants: Version 2 - June 2015. https://www.gov.scot/publications/marine-licensing-applications-and-guidance/ [accessed 20 July 2021].

SEPA (2022) https://www.sepa.org.uk/data-visualisation/waste-sites-and-capacity-tool/ [accessed 7 April 2022].

SEPA (2016) Land Use Planning System SEPA Guidance Note 13: SEPA standing advice for The Department of Energy and Climate Change and Marine Scotland on marine consultations. Issue No. 5. Issued 29/09/2016.

Appendix A
2022 sediment sampling results

a b

Pre-disposal Sampling Results Form

Version 2 - June 2017

This form should be used to submit the results from your pre-disposal sampling plan.
Full information must be provided in all relevant sheets of this workbook. The blue cells in each worksheet indicate where information can be entered.
Where information cannot be provided, or where there are more than 30 samples required, please contact the Marine Scotland - Licensing Operations Team (MS-LOT) using the contact details below.

Once you have completed this form, send it (including any reference number for the dredging and sea disposal marine licence application in the subject header of your email) to the following email address:
ms.marinelicensing@gov.scot

If you have any questions in relation to this form contact MS-LOT:

Marine Scotland - Licensing Operations Team
Marine Laboratory
375 Victoria Road
Aberdeen, AB11 9DB

01224 295579
ms.marinelicensing@gov.scot

Applicant Information

Applicant:	Aberdeen Harbour Board
Description of dredging:	Maintenance dredging South Harbour 2022
Total amount to be dredged (wet tonnes)	61000

Sample Details & Physical Properties

Explanatory Notes:
An example of a 'Dredge area' is: 'Dock A, Harbour X'
Provide description of the dredge area and the latitude and longitude co-oridnates (WGS84) for each sample location. Co-ordinates taken from GPS equipment should be set to WGS84.
Note for sample depth that the seabed is 0 metres.
Gravel is defined as >2mm, **Sand** is defined as >63um<2mm, **Silt** is deinfed as <63um).

Sample information:

Sample ID	Dredge area	Latitude	Longitude	Type of sample	Sample depth (m)	Total solids (%)	Gravel (%)	Sand (%)	Silt (%)	TOC (%)	Specific gravity	Asbestos
AR01376.001 - A	South Harbour	57°08.097`N	002°03.460`W	Grab	0	91.9	68.1	24.7	7.2			No
AR01376.002 - A	South Harbour	57°08.097`N	002°03.015`W	Grab	0	41.2	1.2	18.3	80.5		2.55	No
AR01376.003 - A	South Harbour	57°08.041`N	002°02.999`W	Grab	0	40.9	0	10.4	89.6		2.43	No
AR01376.004 - A	South Harbour	57°07.91Ha`N	002°02.815`W	Grab	0	50.2	0	28.8	71.2		2.42	No
AR01376.005 - A	South Harbour	57°07.944`N	002°02.777`W	Grab	0	67.9	0.2	87.1	12.7		2.66	No
AR01376.006 - A	South Harbour	57°07.866`N	002°02.763`W	Grab	0	38.6	0	18.3	81.7		2.32	No
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Trace Metals & Organotins

Explanatory Notes:
Results above Action Level 1 will be highlighted in blue and above Action Level 2 in red.

Sample information:

Sample ID	Dredge area	Type of sample	Sample depth (m)	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Zinc (Zn)	Dibutyltin (DBT)	Tributyltin (TBT)
				mg/kg dry weight									
R01376.001 - A	South Harbour	Grab	0	2.6	0.18	17.1	14	0.01	11.9	8	39.4	<0.001	<0.001
R01376.002 - A	South Harbour	Grab	0	12.6	0.23	36.5	37.7	0.07	22.9	26.1	90.6	<0.005	<0.005
R01376.003 - A	South Harbour	Grab	0	11.6	0.32	37.1	34.2	0.07	23.3	28.6	89.1	<0.005	<0.005
R01376.004 - A	South Harbour	Grab	0	9.5	0.41	23.9	13.3	0.06	14.7	22.8	53.5	<0.005	<0.005
R01376.005 - A	South Harbour	Grab	0	5	0.06	8.9	6.7	0.01	6	5.9	22	<0.005	<0.005
R01376.006 - A	South Harbour	Grab	0	4.8	0.07	8.6	6.4	0.01	5.5	5.6	24.7	<0.005	<0.005
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Polyaromatic Hydrocarbons (PAH)

Explanatory Notes:
Results above Action Level 1 will be highlighted in blue and above Action Level 2 in red.

Definitions:

ACENAPTH	Acenaphthene
ACENAPHY	Acenaphthylene
ANTHRACN	Anthracene
BAA	Benz(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BEP	Benzo(e)pyrene
BENZGHIP	Benzo(ghi)perylene
BKF	Benzo(K)fluoranthene
C1N	C1-naphthalenes
C1PHEN	C1-phenanthrene
C2N	C2-naphthalenes
C3N	C3-naphthalenes
CHRYSENE	Chrysene
DBENZAH	Diben(ah)anthracene
FLUORANT	Fluoranthene
FLUORENE	Fluorene
INDPYR	Indeno(1,2,3-cd)pyrene
NAPTH	Naphthalene
PERYLENE	Perylene
PHENANT	Phenanthrene
PYRENE	Pyrene
THC	Total Hydrocarbon Content

Sample information:

Sample ID	Dredge area	Type of sample	Sample depth (m)	µg/kg																								
				ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF	BEP	BENZGHIP	BKF	C1N	C1PHEN	C2N	C3N	CHRYSENE	DBENZAH	FLUORANT	FLUORENE	INDPYR	NAPTH	PERYLENE	PHENANT	PYRENE	THC
MAR01376.001 - AH	South Harbour	Grab	0	<1	<1	<1	<1	<1	<1		<1	<1					<1	<1	<1	<1	<1	<1		<1	<1	16000
MAR01376.002 - AH	South Harbour	Grab	0	10.6	15.2	27.9	72.7	97.8	109		114	66.2					80.9	18.2	134	9.58	116	16.8		68.5	140	144000
MAR01376.003 - AH	South Harbour	Grab	0	5.77	10.3	22.3	53.7	66.7	74.7		79.3	39.6					60.3	13.1	102	9.49	78.2	14.3		53.4	106	158000
MAR01376.004 - AH	South Harbour	Grab	0	6.57	6.24	15	30.4	38.8	40.1		45.4	24.1					35.4	7.91	57.2	7.09	45.1	15.1		46.2	59.3	74900
MAR01376.005 - AH	South Harbour	Grab	0	1.43	2.26	8.92	26.8	30.9	22.4		23.4	14.9					26.7	4.16	53.4	1.9	22.8	2.07		18.4	57.1	591000
MAR01376.006 - AH	South Harbour	Grab	0	4.36	7.73	15.1	41	53.6	75.8		67.6	36.5					44.3	11.6	77.1	7.55	75.2	14.3		49.5	81.6	129000
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Organohalocarbons

Reprocessing Notes:
Results above Action Level 1 will be highlighted in blue and above Action Level 2 in red.
SUM7 is the sum of PCB 28,52,101,138,153,180 and 118.

Abbreviations:

PCB-028	2,4,4'-Trichlorobiphenyl (PCB-28)
PCB-052	2,2',5,5'-Tetrachlorobiphenyl (PCB-52)
PCB-101	2,2',4,5,5'-Pentachlorobiphenyl (PCB-101)
PCB-118	2,3',4,4',5-Pentachlorobiphenyl (PCB-118)
PCB-138	2,2',3,4,4',5'-Hexachlorobiphenyl (PCB-138)
PCB-153	2,2',4,4',5,5'-Hexachlorobiphenyl (PCB-153)
PCB-180	2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB-180)

Biotrends Individual List :

Biotrends ID	Sample plate	Type of sample	Sample depth (m)	Sum7pcb	pcb-028	pcb-052	pcb-101	pcb-118	pcb-138	pcb-153	pcb-180	pcb-028	pcb-052	pcb-101	pcb-118	pcb-138	pcb-153	pcb-180	Sum7pcb	pcb-028	pcb-052	pcb-101	pcb-118	pcb-138	pcb-153	pcb-180	Sum7pcb	pcb-028	pcb-052	pcb-101	pcb-118	pcb-138	pcb-153	pcb-180	Sum7pcb	pcb-028	pcb-052	pcb-101	pcb-118	pcb-138	pcb-153	pcb-180	Sum7pcb	pcb-028	pcb-052	pcb-101	pcb-118	pcb-138	pcb-153	pcb-180
				ng/kg								ug/kg								ug/kg								ug/kg								ug/kg								ug/kg						
Lipid%																																																
Wet Weight (g)																																																
Dry Weight (g)																																																
Extraction Volume (ml)																																																
Final Extract Volume (ul)																																															
Dilution																																																
Recovery Standard																																																
Internal Standard																																																
Surrogate Standard																																																
Injection Standard																																																
Comments																																																
LOR				0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01																																					
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PR Details

Total amount to be dredged (wet tonnes)	61000

Explanatory Notes:
The values entered for each determinand should be an average wet weight concentration from all the samples representing the material to be disposed to sea. They should be entered in the units stated in the Unit of measurement column in the table below.
Results above Action Level 1 will be highlighted in blue and above Action Level 2 in red.

Average for the total dredge area:

Sample ID	Unit of measurement	
Total Solids	%	55.1
Gravel	%	11.6
Sand	%	31.3
Silt	%	57.2
Arsenic (As)	mg/kg	3.8
Cadmium (Cd)		0.11
Chromium (Cr)		11.3
Copper (Cu)		9.5
Mercury (Hg)		0.02
Nickel (Ni)		7.3
Lead (Pb)		7.9
Zinc (Zn)		27.1
Dibutyltin (DBT)		<0.005
Tributyltin (TBT)		<0.005
Acenapth	µg/kg	2.29
Acenapthylene		3.19
Anthracn		6.84
BAA		17
BAP		21.6
BBF		23.5
BEP		
Benzghip		24.2
BKF		13.5
C1N		
C1PHEN		
C2N		
C3N		
Chrysene		18.7
Debenzah		4.19
Flurant		32.1
Fluorene		2.77
Indypr		24.6
napth		4.7
perylene		
phenant		17.7
pyrene		33.7
THC		104517
PCB28		<0.08
PCB52		0.09
PCB101		0.1
PCB118		0.09
PCB138		0.1
PCB153		0.1
PCB18		
PCB105		
PCB110		
PCB128		
PCB141		
PCB149		
PCB151		
PCB156		
PCB158		
PCB170		
PCB180		<0.08
PCB183		
PCB187		
PCB194		
PCB31		
PCB44		
PCB47		
PCB49		
PCB66		
ICES7		0.57
AHCH		<0.1
BHCH		<0.1
GHCH		<0.1
DIELDRIN		<0.1
HCB		<0.1
DDE		0.12
DDT		<0.1
TDE		<0.1
BDE100		
BDE138		
BDE153		
BDE154		
BDE17		
BDE183		
BDE209		
BDE28		
BDE47		
BDE66		
BDE85		
BDE99		

Comments:

Laboratory Details

Explanatory Notes:
Please complete a separate worksheet for each laboratory (e.g. complete 'Laboartory_1' worksheet for 1 laboratory and complete 'Laboartory_2' worksheet for a second laboratory). If there are more than 3 laboratories then please contact MS-LOT.

Laboratory 1 Details:

Laboratory name:	SOCOTEC UK Ltd
Year:	2022

LabRefMat	**Q1**	Does the laboratory carrying out the analyses undertake the analysis of blank samples and laboratory reference materials with each batch of samples of waste and other material dumped in the maritime area that is analysed by that laboratory?	Yes
CompAnal	**Q2**	Does the laboratory carrying out the analyses undertake periodic comparative analysis of laboratory reference materials and certified reference materials?	Yes
QAQC	**Q3**	Does the laboratory carrying out the analyses undertake the compilation of quality control charts based upon the data resulting from the analyses of the laboratory reference materials and certified reference materials, and the use of those quality control charts to monitor analytical performance in relation to all samples of dumped wastes or other materials?	Yes
InterlabCaleb	**Q4**	Does the laboratory carrying out the analyses undertake periodic participation in interlaboratory comparison exercises, including, where possible, international comparison exercises?	Yes
InternatCaleb	**Q5**	Does the laboratory carrying out the analyses undertake periodic participation in national and, where possible, international laboratory proficiency schemes?	Yes
SpikedSamples	**Q6**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory analyse samples of substances which are provided by the organisers of the scheme?	Yes
BlindSamples	**Q7**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory confirm that the composition of those samples is not disclosed in advance?	Yes
Ranking	**Q8**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory confirm that the results of the scheme for each participating laboratory are made available to all participating laboratories?	Yes
FracAnal	**Q9**	Enter the size fraction that is analysed i.e. Whole or less than 63µm etc.	<63um(metals)
GranMeth	**Q10**	PSA method	NMBAQC
OCMeth	**Q11**	Organic Carbon method	carbonate removal and sulfurous acid/combustion at 1600°C/NDIR,
MetExtrType	**Q12**	Method of extraction used for metal analysis	Aquaregia
MethOfDetMetals	**Q13**	Method of detection used for metal analysis	ICP-MS
PAHExtrType	**Q14**	Method of extraction used for poly aromatic hydrocarbon analysis	Methanol/DCM solvent extraction with silica clean up and copper clean up stages
MethOfDetPAH	**Q15**	Method of detection used for poly aromatic hydrocarbons analysis	GCMS
OHExtrType	**Q16**	Method of extraction used for organohalogens inc PCBs, pesticides, flame retardants etc analysis	Ultrasonic acetone/hexane solvent extraction
MethOfDetOH	**Q17**	Method of detection used for organohalogens inc PCBs, pesticides, flame retardants etc analysis	GCMSMS
OTExtrType	**Q18**	Method of extraction used for organotin analysis	derivatisation and solvent extraction
MethOfDetOT	**Q19**	Method of detection used for organotin analysis	GCMS

		LOD/LOQ	Precision (%)	Recovery (%)
mg/kg	Hg	0.01	4.2	98
	As	0.5	2.7	101
	Cd	0.04	3.6	107
	Cu	0.5	2.9	104
	Pb	0.5	3	98
	Zn	2	2.6	98
	Cr	0.5	3.1	106
	Ni	0.5	3.6	101
	TBT	0.001	12.62	58
	DBT	0.001	12.62	63
µg/kg	PCB28	0.08	12.56	82
	PCB31			
	PCB44			
	PCB47			
	PCB49			
	PCB52	0.08	6.999	98
	PCB66			
	PCB101	0.08	8.43	91
	PCB105			
	PCB110			
	PCB118	0.08	14.61	98
	PCB128			
	PCB138+163	0.08	12.93	59
	PCB141			
	PCB149			
	PCB151			
	PCB153	0.08	7.41	69
	PCB156			
	PCB158			
	PCB170			
	PCB180	0.08	9.85	31
	PCB183			
	PCB187			
	PCB194			
	DDE	0.1	8.2	70
	DDT	0.1	10.6	113
	DDD	0.1	11	80
	Dieldrin	0.1	10.8	106
	Lindane	0.1	8.5	108
	HCB	0.1	2.8	76
	BDE17			
	BDE28			
	BDE47			
	BDE66			
	BDE85			
	BDE99			
	BDE100			
	BDE138			
	BDE153			
	BDE154			
	BDE183			
	BDE209			
	ACENAPTH	1	6.68	83
	ACENAPHY	1	7.74	137
	ANTHRACN	1	4.95	97
	BAA	1	9.8	91
	BAP	1	9.07	105
	BBF	1	8.44	83
	BENZGHIP	1	13.46	109
	BEP			
	BKF	1	8.9	110
	C1N			
	C1PHEN			
	C2N			
	C3N			
	CHRYSENE	1	7.87	90
	DBENZAH	1	19.23	103

FLUORENE	1	5.25	82
FLUORANT	1	4.36	86
INDPYR	1	17.1	110
NAPTH	1	3.02	92
PERYLENE			
PHENANT	1	5.41	91
PYRENE	1	4.29	92
THC	100	N/A	93

Laboratory Details

Explanatory Notes:
Please complete a separate worksheet for each laboratory (e.g. complete 'Laboartory_1' worksheet for 1 laboratory and complete 'Laboartory_2' worksheet for a second laboratory). If there are more than 3 laboratories then please contact MS-LOT.

Laboratory 2 Details:

Laboratory name:	
Year:	

LabRefMat	**Q1**	Does the laboratory carrying out the analyses undertake the analysis of blank samples and laboratory reference materials with each batch of samples of waste and other material dumped in the maritime area that is analysed by that laboratory?	
CompAnal	**Q2**	Does the laboratory carrying out the analyses undertake periodic comparative analysis of laboratory reference materials and certified reference materials?	
QAQC	**Q3**	Does the laboratory carrying out the analyses undertake the compilation of quality control charts based upon the data resulting from the analyses of the laboratory reference materials and certified reference materials, and the use of those quality control charts to monitor analytical performance in relation to all samples of dumped wastes or other materials?	
InterlabCaleb	**Q4**	Does the laboratory carrying out the analyses undertake periodic participation in interlaboratory comparison exercises, including, where possible, international comparison exercises?	
InternatCaleb	**Q5**	Does the laboratory carrying out the analyses undertake periodic participation in national and, where possible, international laboratory proficiency schemes?	
SpikedSamples	**Q6**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory analyse samples of substances which are provided by the organisers of the scheme?	
BlindSamples	**Q7**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory confirm that the composition of those samples is not disclosed in advance?	
Ranking	**Q8**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory confirm that the results of the scheme for each participating laboratory are made available to all participating laboratories?	
FracAnal	**Q9**	Enter the size fraction that is analysed i.e. Whole or less than 63µm etc.	
GranMeth	**Q10**	PSA method	
OCMeth	**Q11**	Organic Carbon method	
MetExtrType	**Q12**	Method of extraction used for metal analysis	
MethOfDetMetals	**Q13**	Method of detection used for metal analysis	
PAHExtrType	**Q14**	Method of extraction used for poly aromatic hydrocarbon analysis	
MethOfDetPAH	**Q15**	Method of detection used for poly aromatic hydrocarbons analysis	
OHExtrType	**Q16**	Method of extraction used for organohalogens inc PCBs, pesticides, flame retardants etc analysis	
MethOfDetOH	**Q17**	Method of detection used for organohalogens inc PCBs, pesticides, flame retardants etc analysis	
OTExtrType	**Q18**	Method of extraction used for organotin analysis	
MethOfDetOT	**Q19**	Method of detection used for organotin analysis	

		LOD/LOQ	Precision (%)	Recovery (%)
mg/kg	Hg			
	As			
	Cd			
	Cu			
	Pb			
	Zn			
	Cr			
	Ni			
	TBT			
	DBT			
µg/kg	PCB28			
	PCB31			
	PCB44			
	PCB47			
	PCB49			
	PCB52			
	PCB66			
	PCB101			
	PCB105			
	PCB110			
	PCB118			
	PCB128			
	PCB138+163			
	PCB141			
	PCB149			
	PCB151			
	PCB153			
	PCB156			
	PCB158			
	PCB170			
	PCB180			
	PCB183			
	PCB187			
	PCB194			
	DDE			
	DDT			
	DDD			
	Dieldrin			
	Lindane			
	HCB			
	BDE17			
	BDE28			
	BDE47			
	BDE66			
	BDE85			
	BDE99			
	BDE100			
	BDE138			
	BDE153			
	BDE154			
	BDE183			
	BDE209			
	ACENAPTH			
	ACENAPHY			
	ANTHRACN			
	BAA			
	BAP			
	BBF			
	BENZGHIP			
	BEP			
	BKF			
	C1N			
	C1PHEN			
	C2N			
	C3N			
	CHRYSENE			
	DBENZAH			

FLUORENE			
FLUORANT			
INDPYR			
NAPTH			
PERYLENE			
PHENANT			
PYRENE			
THC			

Laboratory Details

Explanatory Notes:
Please complete a separate worksheet for each laboratory (e.g. complete 'Laboartory_1' worksheet for 1 laboratory and complete 'Laboartory_2' worksheet for a second laboratory). If there are more than 3 laboratories then please contact MS-LOT.

Laboratory 3 Details:

Laboratory name:	
Year:	

LabRefMat	**Q1**	Does the laboratory carrying out the analyses undertake the analysis of blank samples and laboratory reference materials with each batch of samples of waste and other material dumped in the maritime area that is analysed by that laboratory?	
CompAnal	**Q2**	Does the laboratory carrying out the analyses undertake periodic comparative analysis of laboratory reference materials and certified reference materials?	
QAQC	**Q3**	Does the laboratory carrying out the analyses undertake the compilation of quality control charts based upon the data resulting from the analyses of the laboratory reference materials and certified reference materials, and the use of those quality control charts to monitor analytical performance in relation to all samples of dumped wastes or other materials?	
InterlabCaleb	**Q4**	Does the laboratory carrying out the analyses undertake periodic participation in interlaboratory comparison exercises, including, where possible, international comparison exercises?	
InternatCaleb	**Q5**	Does the laboratory carrying out the analyses undertake periodic participation in national and, where possible, international laboratory proficiency schemes?	
SpikedSamples	**Q6**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory analyse samples of substances which are provided by the organisers of the scheme?	
BlindSamples	**Q7**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory confirm that the composition of those samples is not disclosed in advance?	
Ranking	**Q8**	If the answer to questions 4 or 5 is 'Yes' then does the laboratory confirm that the results of the scheme for each participating laboratory are made available to all participating laboratories?	
FracAnal	**Q9**	Enter the size fraction that is analysed i.e. Whole or less than 63µm etc.	
GranMeth	**Q10**	PSA method	
OCMeth	**Q11**	Organic Carbon method	
MetExtrType	**Q12**	Method of extraction used for metal analysis	
MethOfDetMetals	**Q13**	Method of detection used for metal analysis	
PAHExtrType	**Q14**	Method of extraction used for poly aromatic hydrocarbon analysis	
MethOfDetPAH	**Q15**	Method of detection used for poly aromatic hydrocarbons analysis	
OHExtrType	**Q16**	Method of extraction used for organohalogens inc PCBs, pesticides, flame retardants etc analysis	
MethOfDetOH	**Q17**	Method of detection used for organohalogens inc PCBs, pesticides, flame retardants etc analysis	
OTExtrType	**Q18**	Method of extraction used for organotin analysis	
MethOfDetOT	**Q19**	Method of detection used for organotin analysis	

		LOD/LOQ	Precision (%)	Recovery (%)
mg/kg	Hg			
	As			
	Cd			
	Cu			
	Pb			
	Zn			
	Cr			
	Ni			
	TBT			
	DBT			
µg/kg	PCB28			
	PCB31			
	PCB44			
	PCB47			
	PCB49			
	PCB52			
	PCB66			
	PCB101			
	PCB105			
	PCB110			
	PCB118			
	PCB128			
	PCB138+163			
	PCB141			
	PCB149			
	PCB151			
	PCB153			
	PCB156			
	PCB158			
	PCB170			
	PCB180			
	PCB183			
	PCB187			
	PCB194			
	DDE			
	DDT			
	DDD			
	Dieldrin			
	Lindane			
	HCB			
	BDE17			
	BDE28			
	BDE47			
	BDE66			
	BDE85			
	BDE99			
	BDE100			
	BDE138			
	BDE153			
	BDE154			
	BDE183			
	BDE209			
	ACENAPTH			
	ACENAPHY			
	ANTHRACN			
	BAA			
	BAP			
	BBF			
	BENZGHIP			
	BEP			
	BKF			
	C1N			
	C1PHEN			
	C2N			
	C3N			
	CHRYSENE			
	DBENZAH			

FLUORENE			
FLUORANT			
INDPYR			
NAPTH			
PERYLENE			
PHENANT			
PYRENE			
THC			

Grab	Yes
Core	No

Appendix B
Correspondence with Aberdeenshire Council regarding beach recharge

From: [redacted]
To:
Cc: [redacted]
Subject: RE: Aberdeen Harbour Board - dredged material
Date: 19 August 2021 18:13:29
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image007.png

Hello [redacted],

Hope you are keeping well.
I would confirm that our position has not changed and we currently have no use for any dredged material.

Thank you.

Regards,
[redacted]

Principal Engineer
Flood Risk & Coast Protection
Infrastructure Services
Aberdeenshire Council
Telephone – [redacted]

---

www.aberdeenshire.gov.uk
Follow us at:

From: [redacted]
Sent: 19 August 2021 15:12
To: [redacted]
Cc: [redacted] **Subject:** RE: Aberdeen Harbour Board - dredged material

Dear [redacted],

I hope you're well. It's that time of year again when we're applying to renew our marine licence application for depositing dredged material at sea.

Could you please let me know whether your position below remains the same regarding potential uses of the dredged material?

Many thanks,
[redacted]

[redacted]
Environmental Advisor

T [redacted]
M: [redacted]

From: [redacted]
Sent: 11 November 2020 11:48
To: [redacted]
Cc: [redacted] **Subject:** RE: Aberdeen Harbour Board - dredged material

Dear [redacted],

Thank you for contacting me again. I would confirm that our position has not changed and we currently have no use for any dredged material. As below, we will contract you if we see a use emerge for this material.

Regards,
[redacted]

Principal Engineer
Flood Risk & Coast Protection
Infrastructure Services
Aberdeenshire Council
Telephone – [redacted]

---

www.aberdeenshire.gov.uk

Follow us at:

From: [redacted]
Sent: 11 November 2020 10:43
To: [redacted]
Cc: [redacted]
Subject: RE: Aberdeen Harbour Board - dredged material

Dear [redacted],

You may recall we spoke back in 2018 about the potential use of dredged material from Aberdeen Harbour's annual maintenance dredging campaign for Aberdeenshire Council projects, for example coastal protection, beach recharge, construction projects etc. See email trail below for reference.

We are seeking to renew our marine licence with Marine Scotland and I would be grateful if you could please confirm whether your position below remains the same. If you do see a potential need for material within the next 18 months perhaps you could give me a call on [redacted] to discuss.

Many thanks in advance,
[redacted]

[redacted]
Environmental Advisor

T: [redacted]
M: [redacted]

From: [redacted]
Sent: 01 February 2018 23:37
To: [redacted] **Subject:** RE: Aberdeen Harbour Board - dredged material

Many thanks [redacted] much appreciated.

Regards,
[redacted]

From: [redacted]
Sent: 01 February 2018 13:58
To: [redacted]
Subject: FW: Aberdeen Harbour Board - dredged material

Dear [redacted]

Further to our telephone conversation earlier today, I would confirm that we have no change in opinion from that stated in our previous letter dated 15th July 2015. We currently have no use for any dredged material.

Thank you for contacting us again regarding this matter.

Regards,
[redacted]

Principal Engineer
Flood Risk & Coast Protection
Infrastructure Services
Aberdeenshire Council
Telephone – [redacted]

---
www.aberdeenshire.gov.uk
Follow us at:

From: [redacted]
Sent: 01 February 2018 09:44
To: [redacted]
Subject: Aberdeen Harbour Board - dredged material

Dear [redacted],

Good to talk to you just now. As discussed, I'd be grateful if you could confirm by return of email that Aberdeenshire Council's position has not changed since [redacted]'s attached letter dated 15 July 2015 – i.e. you do not have any current plans that would make use of dredged material.

Many thanks,
[redacted]

[redacted]
Aberdeen Harbour Board
16 Regent Quay
Aberdeen, AB11 5SS
Tel: [redacted]
Mob: [redacted]

Aberdeen Harbour
www.aberdeen-harbour.co.uk

apologies and notify the sender, deleting the e-mail afterwards. Any views or opinions presented are solely those of the e-mail's author and do not necessarily represent those of Aberdeenshire Council. www.aberdeenshire.gov.uk Dh'fhaodadh fiosrachadh sochaire, a tha a-mhàin airson an neach gu bheil am post-dealain air a chur, a bhith an seo. Ma tha thu air am post-dealain fhaighinn mar mhearachd, gabh ar leisgeul agus cuir fios chun an neach a chuir am post-dealain agus dubh às am post-dealain an dèidh sin. 'S e beachdan an neach a chuir am post-dealain a tha ann an gin sam bith a thèid a chur an cèill agus chan eil e a' ciallachadh gu bheil iad a' riochdachadh beachdan Chomhairle Shiorrachd Obar Dheathain. www.aberdeenshire.gov.uk

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