ABERDEEN MARINE

HAWES PIER DREDGING

Best Practicable Environmental Option Report

CLIENT:

THE CITY OF EDINBURGH COUNCIL

ABERDEEN MARINE LTD
GLEN ORCHY PLACE
KILMARNOCK
KA2 0LU

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Document Control

Task	Initials	Position	Signature
Prepared By	JF	Operations Manager	
Reviewed By	SL	Engineering Manager	
Approved By	SL	Engineering Manager	

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Hawes Pier Dredging –
Best Practicable Environmental Option Report

Client:	**The City of Edinburgh Council** **Structures & Flood Prevention** **Place Management** **Waverley Court G4** **4 East Market Street** **Edinburgh** **EH8 8BG**
Contact:	**Sean Fahy** **Tel: 0131 469 3294** **sean.fahy@edinburgh.gov.uk**

Location:	**Hawes Pier** **New Halls Road** **South Queensferry** **Edinburgh** **EH30 9TB**

Main Contractor:	**Aberdeen Marine Ltd** **Glen Orchy Place** **Kilmarnock** **KA2 0LU**
Contact:	**Scott Laurie** **Tel: 01563 550090** **Mob: 07803 260417** **scott@aberdeenmarine.com**

Dredging Contractor:	**Northern Dredging Ltd** **41 McDowall Road,** **Edinburgh,** **EH9 3EQ**
Contact:	**Neville Harrison** **Mob: 07393 586352** **air_tight@hotmail.com**

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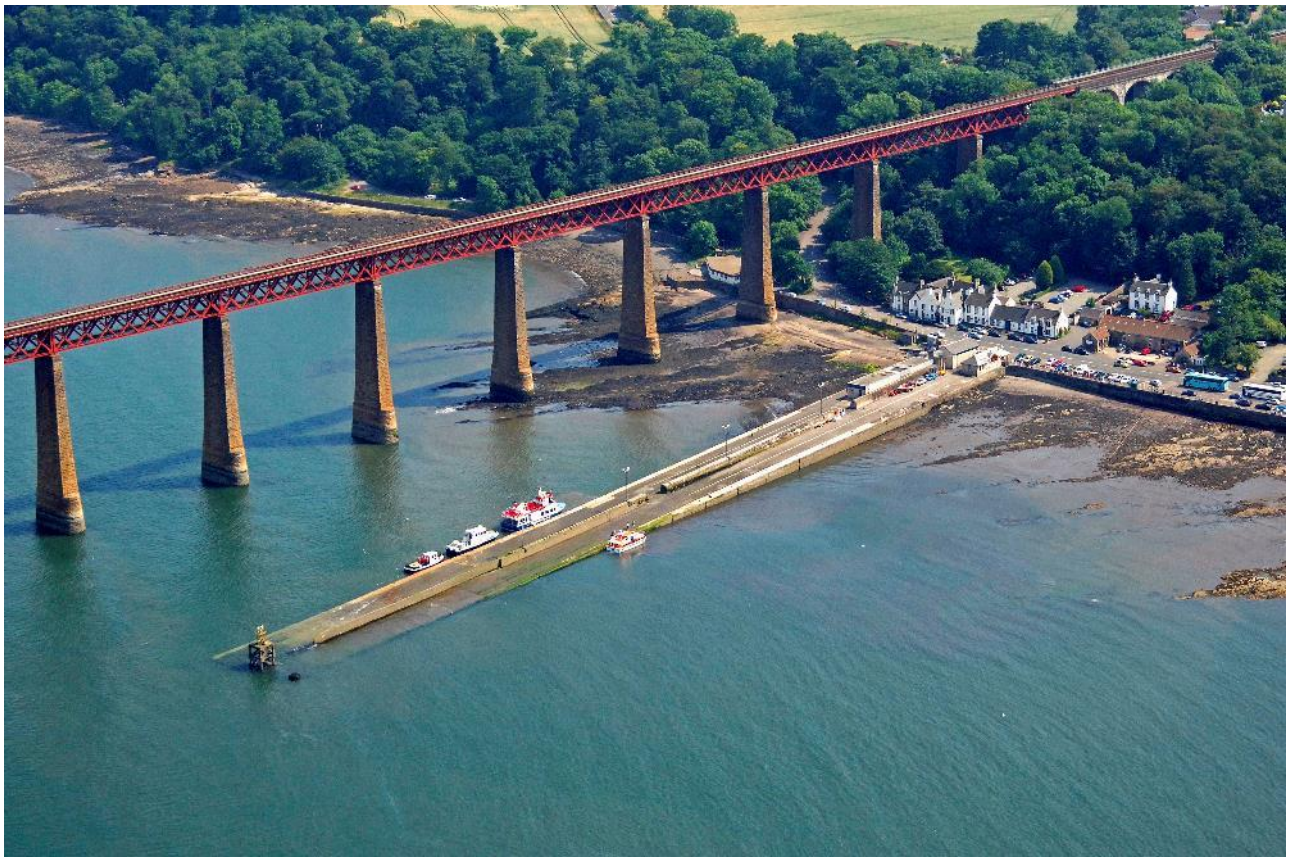
INTRODUCTION

HAWES PIER



Hawes Pier	**Admiralty Chart No. 736**
Latitude	**55º 59'N**
Longitude	**03º 23'W**

The Hawes Pier was constructed in c.1812 by Scottish civil engineer John Rennie, probably in collaboration with Robert Stevenson. It is situated at the East end of the South Queensferry seafront promenade, to the East of the village of New Halls, and immediately West of the Forth Rail Bridge. It is a ramped masonry ferry pier with a central wall and is a category C listed building; there is a fixed beacon at its northern end and a disused sandstone hexagonal lighthouse with a rusticated base at its southern (landward) end, which itself is a category B listed building.

INTRODUCTION

The pier is c.285m in length, c.25m wide, and is shaped like a slipway, sloping down into the Forth so that up to c.75% of the pier is underwater at high tide. This allows at least part of the pier to be usable at all times. The central wall is c.2m in height and divides much of the pier down the middle, with a few breaks to allow passage to either side. Modern buildings, including a RNLI station, are grouped in the southern area, almost covering the area above HWM. The pier is owned and managed by the City of Edinburgh Council, and is located within the South Queensferry Conservation Area.

The hamlet of New Halls to the east of the original settlement developed a pier and inns to cater for crossing traffic. Its name evolved into Hawes and it was eventually amalgamated into the Royal Burgh. It later became the base for construction yards and workers' accommodation for the Forth Bridge. It was built as part of a plan to improve the ferry crossing between North and South Queensferry, building or upgrading piers, facilities and access roads on both sides, using public and private finances. Hawes Pier was used regularly as the Southern terminus of the vehicular ferry across the Queensferry Narrows, which took passengers and cargo across the river until the opening of the Forth Road Bridge in 1964 ended the service.

The pier is still in regular use, notably by leisure craft that offer tours of the Forth and take visitors to Inchcolm Island from April to October, and the harbour is used for private boat mooring. A 20th century building houses an office, ticket desk, and shop. The RNLI operates one of Scotland's busiest stations from buildings on the pier, rescuing more people than any other inshore lifeboat crew. They have a new building on the pier that was finished in 2012.

Occasionally, visiting cruise liners anchored in the Forth ferry their passengers to and from the pier on small boats. The Forth itself is a busy shipping channel, and provides a range of water sport activities. Dalmeny Tank Farm is situated in the Forth and linked by pipeline to the tanker terminal at Hound Point. Staff for the Hound Point oil terminal use the Hawes Pier as the shore terminal for workboat sailings, and one of the companies associated with the terminal maintains an office in a modern building on the pier itself.

The Hawes Pier is in generally good condition, but has required repairs in the past and is periodically inspected in order to monitor said condition.

INTRODUCTION

1.1 Background to Application

City of Edinburgh Council is the owner of Hawes Pier, however it falls within the confine of Forth Ports statutory Harbour.

In order to maintain depths, the pier has been sporadically dredged following an approximate ten year cycle. It is believed that the last capital dredge was carried out by the Coquet Mouth dredger during 2003.

Other dredges have been undertaken more recently, (circa last 6 years) removing small areas by plough.

Dredging is now required at Hawes Pier and is programmed to be undertaken during the period November / December 2021. Accompanying this report is a plan showing the areas to be dredged.

This report assesses the options available for such disposal and examines the Best Practicable Environment Option (BPEO) in accordance with the requirement of the Marine (Scotland) Act 2010.

1.2 Source of Materials

The dredge material is a mixture of silt, sand and small amounts of fine gravel. These sediments enter the site as a result of tide and wave action. The relatively still conditions then allow settlement and deposition. Apart from the discharge from local surface water drains, it is believed that no other material enters the area. There is also a slight scouring action from the waterborne traffic such as ferries and crew transfer vessels, which moves the sediments.

1.3 Description of Materials

As described in 1.2, the dredge material is a mixture of sand and silt. It is estimated that approximately 1663 cubic metres of material requires to be removed from around Hawes Pier.

1.4 Options for Relocation/Removal of Materials

In order to maintain depths within the Hawes Pier site acceptable to the vessel users, it is believed that The City of Edinburgh Council will continue to have a requirement for dredging and, therefore, for disposal of the material removed. It would appear that two options for disposal then exist:

(i) Relocation of the material in the sea; or
(ii) Disposal on land.

1.5 Details of Previous Related Operations

It is understood that the pier has been dredged by backhoe dredger in 2003 and then more recently within the last six years by plough. Due to the differing licensing regimes there are few historical records available.

2 DISCUSSION OF AVAILABLE DISPOSAL OPTIONS

2.1 Introduction

This section of the report discusses all available disposal options for the dredge spoil. Where an option is considered to be impracticable, the reason is given and the option discounted from further consideration. Those options which are considered to be practicable are considered in Section 3 of this report.

2.2 Land Incineration & Subsequent Disposal of Residue

Incineration of the material is not possible. This option for disposal can therefore be discounted.

2.3 Inert Landfill

The material has been identified as being suitable for inert landfill. The nearest landfill that has capacity is at Whitecross, Linlithgow. The distance being 13 miles away.

2.4 Spreading on Agricultural Land or for Soil Conditioning of Reclaimed Land

Spreading on agricultural land has been investigated and no demand from farmers found. The material is not suitable and the sand has no nutritional properties. The chloride salts would leach out from the spoil over a period of years rendering the land unusable and the discharge of saline water and solids in suspension into the local watercourses would need to be controlled. No projects have been identified where soil conditioning of reclaimed land is required. This option for disposal can therefore be discounted.

2.5 Reclamation

It has not been possible to identify any local current sites of land reclamation and this option for disposal can therefore be discounted.

2.6 Beach Nourishment

Due to the grading of the dredge material, it is not suitable for beach nourishment. No local sites where beach nourishment is required have been identified. This option can therefore be discounted.

2.7 Other Beneficial Uses

The finely graded sands and silt content of the dredged material make it unsuitable as a building material. Extensive pre-treatment of the spoil would be required to remove the contamination by fine sediments in order to utilise the coarser sand fractions and therefore render this option unviable. No local current projects could be identified where the dredged material could be used either as a building material (after treatment on site) or in reclamation work.

2.8 Sea Disposal

Although the nature of the dredge spoil does exceed some of the lower action levels of some of the contaminants and polyaromatic hydrocarbons prescribed by Marine Scotland, it does not exceed any of the contamination action levels which would make it unsuitable for sea disposal. Therefore, disposal of this relatively small volume of material at the designated site Oxcars at sea is still considered to be a viable option environmentally.

2.9 Do Nothing Approach

This approach is not a viable option as, if left un-dredged, the harbour would become inaccessible for considerable periods of the tidal range.

3 ASPECTS TO BE TAKEN INTO CONSIDERATION

3.1 Introduction

This section of the report considers the strategic, environmental and cost implications associated with each of the disposal options judged to be practicable in Section 2.

3.2 Strategic Considerations

3.2.1 Land Disposal

Operational Aspects

To transfer material ashore, the material would have to be either discharged directly from the hold/barge by the dredger's own machinery or by a shore based grab or suction device.

Dredged material would have to be stored on shore to drain off excess water prior to being loaded onto lorries due to the disposal site requirements.

Depending on the method employed, disposal to landfill could therefore be achieved by a three stage material handling operation as follows:

- Dredging and transfer to shore
- Loading to lorries
- Transport and disposal

Transport to shore would require the installation of unloading facilities which would be suitable for accommodating the loading to lorries. Grab plant could be required to unload the material and a suitable area would require to be identified for positioning of the plant and lorries and temporary stockpiling of the material. This activity could have time/cost implications for the vessel hire due to the unpredictable access to, and berth time on site due to it being inaccessible during low tide. The lorries could be loaded by mobile plant from the stockpile. The type of vehicle suitable for transporting the material is a rigid bodied tipper with an 18-tonne load capacity. It is estimated that around 270 lorry loads would be needed to complete this task.

Availability of Suitable Sites/Facilities

As reported in 2.3, the nearest landfill site that is suitable is located some 13 miles from Hawes Pier near the town of Linlithgow. Subject to the results of a Waste Management 3 Assessment (WM3) confirming that the dredge material can be deposited at the site, a handling charge would be applicable and the material must be free of excess water.

General Public Acceptability

The disposal of the spoil to landfill would be undertaken in a similar manner to the disposal of municipal waste. However, the significant increase in lorry movements would undoubtedly give rise to public concern because of danger to pedestrians and other road users, impact on the environment and interruption to both vehicular flow and operational aspects of the pier by other vessel users.

Local Acceptability

The road infrastructure of South Queensferry, in particular, is not suited to several hundred heavy lorry loads of spoil being transported. The most direct route accessing the site is narrow and on a steep gradient, significant traffic congestion could be caused and the unavoidable smell and spillage would no doubt prove unacceptable to the local population. An alternative route which extends the journey to 13 miles is more acceptable avoiding South Queensferry.

Legislative Implications

The spoil would be a controlled waste material for the purpose of transport, storage and disposal. As such Part II (34) of the Environmental Protection Act 1990, Part I of The Control of Pollution Act 1974 and Part III (43) of the Finance Act 1996 will apply.

Consultations

The following have been consulted on the disposal to land option: The City of Edinburgh Council, East Lothian Council

3.2.2 Disposal to Sea

<u>Operational Aspects</u>

The deposition of material would involve excavation/suction of the dredge spoil into a vessel and removal from the site to the designated disposal site Oxcars in the Firth of Forth.

Details on the type of vessel(s) will be confirmed once the contractor has been appointed.

ASPECTS FOR CONSIDERATION

Availability of Suitable Sites/Facility

The sea disposal option does require a designated site in the Firth of Forth (Oxcars) to be available for the acceptance of dredge spoil and this is currently used for the disposal of similar material into the Firth of Forth to that which will be recovered from Hawes Pier.

General Public Acceptability

Since the sea disposal occurs in a designated site in the Firth of Forth and is currently in use for other dredging projects successfully, then use of this method is therefore likely to be generally acceptable.

Local Acceptability

Due to either process causing minimal disruption to the harbour users and no negative effect to the local fishing grounds, it is expected that it will be locally acceptable.

Summary of Consultations With Third Parties

With respect to the application process for a license to dispose of dredged material at sea, approvals are expected to be required from Crown Estates Office and consultation with various interested parties including but not limited to SEPA, NatureScot, Forth Ports, Forth District Salmon Fisheries Board & Hawes Pier stakeholders such as RNLI & other vessel users; these will be contacted by Marine Scotland to determine any adverse comments

Pollution/Contamination Implications

Acceptance of the sample testing results by the material is suitable, would mean there would be little or no risk of pollution or contamination from disposal of the material to landfill.

General Ecological Implications

There would be little or no risk of ecological impact arising from disposal to an existing landfill.

Interference With Other Legitimate Activities

There would be no amenity or aesthetic implications arising from disposal to landfill.

3.3 Environmental Considerations

3.3.1 Land Disposal

The transport of the spoil would require an estimated 270 return lorry trips on public roads. The impact to other road users including cyclists and pedestrians will include increased noise and dust levels.

Safety Implications

Significant implications on safety, particularly road traffic, pier users and the general public in the vicinity of the pier area.

Public Health Implications

Increased traffic, dust, fumes, fuel usage, carbon emissions, water spillage are all possible when transporting this material by road.

Pollution/Contamination Implications

Acceptance of the sample testing results by the material is suitable, would mean there would be little or no risk of pollution or contamination from disposal of the material to landfill.

General Ecological Implications

There would be little or no risk of ecological impact arising from disposal to an existing landfill.

Interference With Other Legitimate Activities

There would be no amenity or aesthetic implications arising from disposal to landfill.

3.3.2 Disposal to Sea

The transportation of the spoil to the Oxcars disposal site would require an estimated 15 return trips .There will be negligible disruption to users of the pier given the time of year of the planned dredging but any disruption will be managed to a minimum by the Contractor and Council.

Safety Implications

Disposal at sea would have negligible implications for safety providing that normal navigational and maritime procedures are observed.

Public Health Implications

There are no known threats to public health associated with disposal at the designated site in the Firth of Forth.

Pollution/Contamination Implications

Three samples of the dredge material were removed in March 2021 from the site and analysed by Socotec. The results show that there are a few samples showing contamination slightly higher than AL1 and none higher than AL2.

General Ecological Implications

The deposition of excavated spoil in the designated area Oxcars in the Firth of Forth will only directly impact the seabed in one vicinity and therefore should restrict any noticeable burying of the benthic fauna. The loss of benthic habitat and species due to the deposition of spoil would have an impact on the food sources for species feeding in this location. No objections or complaints have previously been received from local fishermen regarding the effects of this method of disposal at sea on their catches.

It is believed that young salmon and sea trout would use this area to get to sea however, the timings for the movement of Smolt are usually between March and June so these should not be affected.

Interference With Other Legitimate Activities

The disposal method does not significantly affect the commercial shipping lanes or disrupt any fishing grounds. Slight disturbance might be caused to vessels using the Pier during dredging operations. In this case, liaison between the vessel owners and Contractor to make whatever arrangements are necessary to avoid disruption will be required. It should be noted that the planned time to carry out the dredging works is over the winter and the pier is less busy at this time noticeably the tourist trip vessels will be far quieter.

Amenity/Aesthetic Implications

It is considered unlikely that disposal will cause any disturbance to local recreational boating and angling activities.

3.4 Cost Considerations

3.4.1 Land Disposal

Capital Costs

There would be no capital costs associated with disposal to landfill.

Operating Costs

The operating costs associated with disposal to landfill are tabulated below.

Activity Description	Volume (m^3)	Unit Cost (£)	Cost (£)
Excavate by dredger	1663	9.40	
Transfer to lorries	1663	9.00	
Transport by lorries	1663	10.00	
Disposal to landfill	1663	20.60	
Total	**1663**		

3.4.2 Sea Disposal

Capital Costs

There would be no capital costs associated with disposal to sea.

Operating Costs

The cost, utilising both tides per day, is estimated at £30,000.

3.5 National Marine Plan

The planned dredging of Hawes Pier has been considered in conjunction with the National Marine Plan. It is to be carried out in order to maintain safe access/egress of the site with disposal of the dredged material in the designated location of Oxcars spoil ground in the Firth of Forth.

CONCLUSIONS

4 CONCLUSIONS

4.1 Summary of Available Options
4.2 Summary of Primary Objections to Each Option
4.3 Identification of BPEO

4.1 Summary of Available Options

Seven options have been considered for the disposal of dredge spoil material from Hawes Pier. The options of beach nourishment, incineration, disposal to agricultural land, reclamation and use in construction are discounted due to the unsuitability of the material. As previously explained, the "do nothing" option is not a viable consideration. The two remaining options, disposal to land and disposal to sea are reviewed in the summary below.

Acceptability descriptors: Low = significant effect
Moderate = slight effect
High = insignificant effect

Aspect	Disposal to Land	Disposal to Sea
Strategic Acceptability		
Strategic acceptability	Low	High
Operational acceptability (including transport, availability of sites, handling, etc.)	Low	High
General public and local acceptability	Low	High
Environmental Acceptability		
Health & Safety	Moderate	High
Public Health	Moderate	High
Pollution	Low	Moderate
Ecological Implications	Moderate	Moderate
Interference	Low	Moderate
Amenity	High	High
Costs		
Cost per cubic metre	£49.00	£15.00

CONCLUSIONS

4.2 Summary of Primary Objections to Each Option

4.2.1 Disposal to Land

This is the least preferred of the two options on each of strategic, environmental and cost considerations.

Strategically this option is not favoured due to the rapidly increasing pressures on available landfill space. It is the view of local authorities and landfill operators that, where possible, current facilities should be conserved for municipal waste.

In environmental terms, the additional lorry movements are likely to give rise to increases in noise, dust and exhaust emission levels and interference for other road users.

In cost terms, this option is estimated to be about 4 times more expensive than the sea disposal option. The significant element of the cost of this option is attributable to landfill costs.

4.2.2 Disposal to Sea

This is the preferred option on overall strategic terms and is also preferable to the land disposal option on environmental terms given that there will be no disruption to fishing grounds or shipping lanes and disruption to the Hawes Pier users will be managed to a minimum by the contractor and council. The low levels of contaminants, being within the limits stipulated as acceptable for sea disposal, and the relatively small volume of dredge material are not expected to pose an ecological concern to the Firth of Forth. The increase in airborne emissions from the process will be short lived, minimalistic in nature and insignificant in comparison to the lorry movements of the land disposal option. In cost terms this is easily the preferred option.

4.3 Identification of BPEO

It is concluded that the assessment of the BPEO, for disposing of the dredged material from Hawes Pier, is the controlled excavation of the material and disposal at the appropriate site, Oxcars spoil ground in the Firth of Forth, is considered an acceptable option under the terms of the Marine Scotland Act 2010.

APPENDICES

Appendix A – Socotec Sediment Analysis Results

(Socotec Analysis MAR00920.pdf)

Provided separately

Appendix B – Passage Plan

(Passage Plan 1.jpg & Passage Plan 2.jpg)

Provided separately

Appendix C – Oxcars Spoilground Map

(Oxcars Spoilground.pdf)

Provided separately