Malachy Walsh and Partners
Consulting Engineers
Cork | Tralee | Limerick | London

WEXFORD COUNTY COUNCIL

COURTOWN HARBOUR, CO. WEXFORD
BASIN DREDGING LICENCE APPLICATION

INTERIM REPORT

Project No.: 15193
Document No.: 6003-A
Date: March 2014

WEXFORD COUNTY COUNCIL

COURTOWN HARBOUR, CO. WEXFORD
BASIN DREDGING LICENCE APPLICATION

INTERIM REPORT

Project Number 15193

Project No.: 15193
Document No.: 6003-A
Date: March 2014

Project No.	Rev	Date	Prepared By	Checked by	Approved By	Status
15193	A	20.03.14	E Lucey	P Parle	P. O'Donnell	Report

Contents

1.0 Introduction

1.1 General

Malachy Walsh and Partners were commissioned by Wexford County Council to attain the necessary permissions for dredging works in Courtown Harbour.

It is the intention of Wexford County Council, as the Courtown Harbour Authority, to dredge the harbour basin to lower the bed levels and allow for improved Harbour usage.

The work to date in relation to the dredging permissions is as follows:

- A bathymetric survey has been undertaken by Hydrographic Surveys Ltd and a copy of this survey is attached.
- Estimates have been made of the potential volumes of dredge material to be taken from the harbour basin.
- Three sediment samples were taken and the combined sample analysed for contaminants in relation to the disposal of the material at sea and disposal on land.

This interim report describes:

- The surveys and analyses undertaken to date;
- The likely design dredge levels;
- The dredge volumes;
- The nature of the material to be dredged including potential contaminants;
- Proposed dredging methodology and disposal of dredge spoil.

1.2 Courtown Harbour Description

Courtown Harbour is used as a harbour for fishing vessels and leisure craft. It is busiest during the summer months with an increase in leisure/recreational use. The harbour is also a home to an RNLI Station. However, the station accesses the water via a private slipway from the station house to the sea directly.

The inner basin is used for berthing and mooring of vessels. Vessels moor off the quaysides as well as with mooring buoys within the harbour. The inner basin is approximately 1Ha in area. The basin is connected to the sea via a channel. The channel is approximately 200m long and between 10 and 13m in width. The channel is guided by piers on either side. It undergoes routine maintenance dredging works by long reach excavators from the pier sides.

1.3 General Project Scope

To date the scope of this project included:

- Data Gathering: To obtain available data of relevance. This included bathymetric data of the harbour, river flow data for the two streams that flow into the harbour, wave and water

level data from the ICPSS, Admiralty Chart data, data regarding potential land disposal sites, data regarding the nature of the material to be dredged and disposed of, environmental designated areas in the vicinity of Courtown and at potential sea and land disposal sites.

- Procurement of sampling and analysis of sediment to be dredged. The analysis was for contaminants and grain size. Both of these have a bearing on dredge and disposal options and the type and level of investigations and assessments required to obtain the necessary statutory permissions.

- Procurement of a bathymetric survey.

- Undertake an initial high level review regarding potential dredge methods and disposal options.

- The preparation of a dredging design solution and the development of a dredging plan. The dredging plan to include volumes of material, types of material and the frequency of dredging.

- Completion of drawings relating to dredging and disposal. This will include plans, sections and elevations as required and required maps.

- Completion of foreshore licence applications for the dredging and the disposal site (if at sea) application.

1.4 Report Layout

The report layout is as follows:

Section 1 Introduction
Section 2 Data Gathering
Section 3 Surveys
Section 4 Dredging Proposal
Section 6 Summary of Findings
Appendices

2.0 Data Gathering

2.21 Tide Levels

The following are the Tide and Water Levels of importance in Courtown Harbour:

- MHWS: 0.13mODM
- MHWN: -0.17mODM
- MLWN: -0.17mODM
- MLWS: -0.48mODM
- LAT: -0.52mODM

2.2 Environmental Designations

Courtown Harbour is not located in either a Special Area of Conservation (SAC) or Special Protected Area (SPA). It is located adjacent the proposed Natural Heritage Area (pNHA) Courtown Dunes and Glen, 000757.

3.0 Surveys

3.1 Bathymetric Survey

Hydrographic Surveys Ltd, Crosshaven, Co. Cork were contracted to carry out a bathymetric survey of the Inner Harbour Basin and waters to the exterior of the Harbour. The surveys were conducted on the 27th and 31st of May 2013.

The bathymetric survey indicates that the levels within the basin are in the range 1.3 to 2.6m below Ordnance Datum Malin (ODM). The lowest bed levels are in the vicinity of the approach channel into the basin area. For much of the northern half of the basin the bed levels are above -2mODM. This means that at low tide levels many of the craft are close to bottoming out, and the northern area of the harbour is restricted in its use to lower draft craft.

Determination of dredge volumes is further discussed in Section 4.

A copy of the Bathymetric Survey is attached in the Appendices.

3.2 Sediment Sampling and Analysis

In addition to the above works Hydrographics Survey Ltd were contracted to take sediment samples for analysis from the basin bed. Three sediment samples were taken. These three were combined into one sample and analysed for contaminants in relation to the disposal of dredge spoil at sea and on land (Waste Acceptance Criteria, WAC).

The analyses of grain size of the combined sample indicated that the seabed material consists of a mix of silt, fine and medium sand in the approximate proportions 5%, 55% and 35%.

Regarding the WAC, the principal conclusion regarding the sample is that the leachable chlorides are at 3,000 mg/kg which is above the inert level of 800mg/kg but below the non hazardous waste criteria of 15,000 mg/kg. This high reading would be due for the most part to the salt water content of the sample. Similarly the leachable total dissolved solids reading is also above the inert criteria.

A copy of the Sediment Analysis results is attached in the Appendices.

4.0 Dredging Proposal

4.1 Design Dredge Level

Mean Low Water Spring (MLWS) Tide at Courtown is -0.48mODM. The lowest Astronomic Tide (LAT) at Courtown is estimated to be -0.52m ODM. It should be noted that water levels below LAT can occur, caused by meteorological conditions. For example a meteorological high of 1030 millibars could depress sea levels by as much as 0.3m below astronomic tide levels.

A survey of craft using Courtown Harbour undertaken in July 2012 indicated that:

- The deepest draft fishing craft is 1.83m
- The deepest draft leisure craft is 1.96m.

The 1.83m fishing vessel would require the seabed levels in the harbour to be below -2.35mODM for it not to bottom out at LAT. For a similar condition the 1.96m leisure craft would require the levels to be below -2.48mODM.

It would be better to have some under keel clearance for craft using the harbour to allow for fluctuations in water levels due to wave action and meteorological conditions. Based on an under keel clearance of 0.3m at LAT the above craft would require the seabed levels to be below -2.65m ODM and -2.78m ODM respectively. **It is therefore preferable that the seabed level in the basin should be in the range or below -2.6 to -2.8m ODM.**

4.2 Dredge Volumes

Estimates of potential dredge volumes required to dredge the full harbour area to given levels were made. A graphical representation of the varying bed levels and required dredge quantities is shown in Figure1: 15193- SK01. These volumes are summarised below in Table 1

Table 1
Dredge Volumes

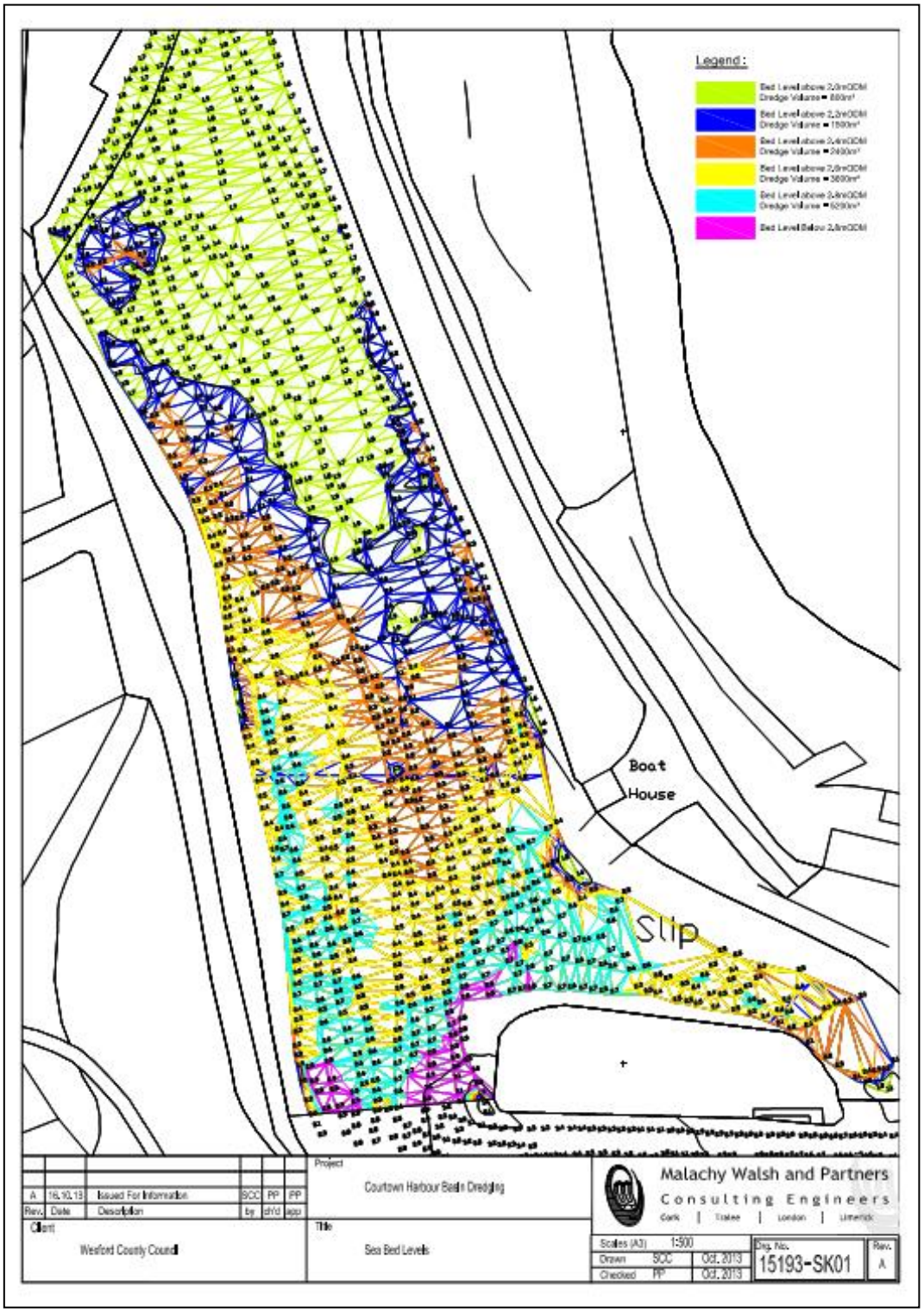
Design Dredge Level (m ODM)	Max Dredge Depth (m)	Dredge Volume (m^3)
-2.0	0.5	1382
-2.2	0.7	2203
-2.4	0.9	3509
-2.6	1.1	5271
-2.8	1.3	7283
-3.0	1.5	9295

The area of the harbour basin is approximately 10,000m^2. A bathymetric survey tolerance of +0.1m would give a potential range in dredge volumes for a given dredge level of about +-1,000m^3. Table 2 summarises the potential range in dredge volumes for design dredge levels of -2.5m ODM and -2.8m ODM.

Table 2
Dredge Volumes

Design Dredge Level mODM	Dredge Volume Lower Bound (m3)	Dredge Volume Upper Bound (m3)	Dredge Volume best Estimate (m3)
-2.5	3,400	5,400	4,400
-2.8	6,300	8,300	7,300

Figure 1: 15193-SK01



4.3 Proposed Dredging Methodology

It is proposed to conduct the dredging of Courtown harbour primarily in the dry. This will have a number of advantages in terms of the project programme and in the minimising of potential environmental impact due to the works.

Drying of the harbour will be achieved by blocking the harbour channel with sand and dewatering the basin. Blocking of the channel is occasionally conducted by the Harbour Authority to protect the basin area from the ingress of wave action during storms and in the past to undertake dredging of the basin and works to the harbour walls. The harbour channel is blocked by the construction of sand embankments within the channel. The harbour has two streams entering into it. One from the north and one from the west. The stream to the north is manmade and is an offshoot of the Owenaverragh River which enters the sea north of Courtown. The northern stream can be blocked at the overflow point from the river. The stream that enters from the west is the Aughboy River. It will not be possible to block this however the stream is small and continuous pumping of the basin area will remove these stream flows.

Once sufficiently dewatered it is proposed to use bulldozers and quay based long reach excavators to pile the dredge spoil into one area of the basin. It is then proposed to create a containing boundary around the spoil using large bulk bags filled with dredge spoil to contain the dredge spoil within a small area for removal into trucks for transport to the land disposal site.

Once this temporary storage area is constructed and the material placed in this area the harbour channel sand embankment and the northern stream blockade can be removed allowing water back into the harbour and use of the harbour to resume. Removal of the dredge spoil can be conducted using a long reach excavator from the quayside adjacent the spoil build up area.

- A sweeper would be kept on site and used to deal with any spillages should they occur.
- Once loaded the trucks will deliver the spoil to the designated land based disposal site.
- An excavator or a dozer would be located at the disposal site and would be used to spread the dredged material.
- Trucks would be cleaned upon leaving the disposal site, before returning to the harbour.
- Dredge works would be conducted outside of the summer season when the harbour is least active.

4.4 Disposal of Dredge Spoils

There are two potential general locations for the disposal of dredge spoil: on land and at sea. If a site can be found on land for the spoil there can be considerable cost savings. The savings relate to the mobilisation and demobilisation of marine based dredging equipment and the costs of bringing dredge material to an offshore site. Because of the relatively small quantity of the proposed dredging material in Courtown such costs will have a considerable bearing on the cost per m^3 of dredging.

Given the quantity and nature of the dredge material and the cost effectiveness of disposing of dredge spoil on land it is proposed to dispose of the dredge spoil in this manner. This option has been explored by the Environment Section of Wexford County Council. Ballyconnigar Quarry was

selected as a potential disposal site. Ballyconnigar Quarry is located approximately 30km and less than 1hr round trip drive from Courtown Harbour. The Wexford County Council Environment Section viewed the site and whilst bearing in mind the nature of the dredge spoils, concluded that this site would be suitable for disposal of the dredge spoils.

5.0 Summary of Findings

- A survey of the craft using the harbour determined that the seabed level in the basin should be in the range or below -2.5 to -2.8m ODM.
- Dredge spoil volumes would be in the range of 6,300m3 to 8,300m3 with a best estimate of 7,300m3 for a design dredge level of -2.8mODM.
- Sediment analysis determined that dredge spoil from the Harbour is suitable for disposal on land.
- It is proposed to dispose of the dredge spoil on land.
- Wexford CoCo has provisionally located a potential land disposal site available in Ballyconnigar Quarry, Co. Wexford.
- Dredging works should be conducted in the dry and outside of the summer season in order to minimise potential impacts on the environment and on harbour users..

Appendix A – Bathymetric Survey

Appendix B – Sediment Analysis Report