



# Stonehaven Harbour Development

## Feasibility Report

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*Reported in a  
local paper  
circa: 1700*

• • •

*'.....Now at the foot  
of this pavement there  
is a small harbour  
which they call  
Steenhyve which  
serves only for pirates  
and picaroons, but it  
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Highlander for  
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**Disclaimer**

***This report has been prepared by PJ Consulting & Associates, with all reasonable skill, care and diligence within the terms of our Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.***



## PART A - TECHNICAL

### 1. Introduction

#### 1.1 Purpose

Stonehaven Town Partnership (STP) has identified issues regarding the sustainability and future financial and operational viability of Stonehaven Harbour.

During a protracted community engagement exercise, 'Planning for Real', similar concerns were highlighted within public responses, though there was a dearth of ideas as to how financial and operational viability could be sustained and a significant opposition, within areas of the community, to any kind of development of the Harbour.

STP determined that, in order to identify possible solutions, a determination had to be made as to what was possible within the environs of the existing Harbour and what, if any, options exist.

Consequently STP sought and obtained funding for a Harbour Development Feasibility Study, whereupon the Stonehaven Harbour Development Feasibility Steering Group was formed to manage the process of the Feasibility Study and its delivery to STP and ultimately to the community of Stonehaven.

#### 1.2 Scope

This Feasibility Report consists of all elements required within the 'Steering Group's' Request for Quotation, including

**Technical Feasibility** – Whether a commercially viable marina development is possible within the existing boundaries of Stonehaven Harbour. This element will include a study of geographic, infrastructural, subsea, and any other technical limitations and/or restrictions.

It will contain suggested formats and designs, including specifications for marina infrastructure and operational parameters and should contain full specification, plans, costing and technical specifications for any 'Harbour Development' upon which the Feasibility Study is predicated.

It will provide an indicative development costing for such a solution

Where a marina is shown to be unfeasible, the study will provide alternate suggested solutions, if possible.

**Environmental Impact Study** – to determine the immediate, short, medium and long-term environmental impact of a development of Stonehaven Harbour.

**Economic Impact Study** – to ascertain the overall economic impact, upon Stonehaven and the area, of a development, or otherwise, of Stonehaven Harbour.

### 1.3 Delivery

PJ Consulting & Associates are the project coordinator and will deliver the technical aspects of the report

In accordance with our preferred policy the following key local solution providers will deliver the Environmental and Economic Assessment elements of the Feasibility report:

Environmental Assessment: Waterman Energy, Environment & Design Ltd

Economic Assessment: M K A Economics

*Aberdeenshire Council had proposed conducting a Bathometric Study of Stonehaven Bay and the adjacent coast. This study has, in the interim, been cancelled. Consequently no Bathometric data can be incorporated within the final Feasibility Report and all costing for subsea and infrastructural work can only be approximate due to a lack of definitive subsea and infrastructural 'hard data'.*

Given the historic nature of Stonehaven Harbour and the depth and breadth of local opinion in relation to it, input and contribution to the Feasibility Study by local interest groups and individuals is a key requirement. Management of this engagement process was by the Steering Group, whose local knowledge and understanding of the issues ensured that all relevant data, information and views were passed on.

Our Feasibility Report examines the potentials for development of the Harbour and environs and focuses on key impact areas.

Both the Environmental and Economic Assessments will be based upon outline solutions, focusing particularly upon the recommended option.

Whilst this Feasibility Report provides the necessary information and details for informed decision making, it does not extend to providing full 'pre-development' scope of work and engineering, environmental and economic impact assessments

These should form the next stage of development once a decision to progress in accordance with 'recommendations' has been taken and suitable developers engaged. In this way the cost of these extended works is incorporated into the development budget.

## **2. Background**

### **2.1 General Information**

*Latitude 56° 58'N - Longitude 02° 12'W. Admiralty Chart No. 1438*

*Average High Tide Variation - 10 minutes after Aberdeen*

Stonehaven Harbour was first built prior to 1607 but was destroyed by storms. It was repaired and again destroyed by storms. In 1678 it was built more robustly but this too broke up under the force of the North Sea.

A new plan was drawn up in 1825 by Robert Stevenson and the Harbour works were constructed successfully. The Harbour was handed over to Stonehaven Town Council in 1962.

This is the largest of the recreational harbours in Aberdeenshire and has three basins extending to 18,200 square metres and 550 metres of berthing space on the quays. There are also additional mooring chains in the inner harbour.

There are almost 140 regular moorings fully occupied and a waiting list for vacancies.

There is no longer a Fish Market at Stonehaven and it is now more of a recreational harbour but it is still used by several fishing boats in the <50-foot class.

Limited services available include water and power points on the quays; a concrete slipway and a 1.5-ton crane lift on the fish jetty. Under certain storm conditions only the inner basin is suitable for berthing and priority is given to local fishing boats.

There are over 50 berths in the inner basin, which may be sealed by heavy steel booms. These offer limited protection in extreme storm conditions. Both inner and outer basins dry out at low water but the cofferdam basin, an open area protected by the breakwater, has a depth of three to four feet (1 metre) at Mean Low Water Springs (MLWS).

Stonehaven has an approximate population of 11,500 and is the former county town of Kincardineshire. Stonehaven is widely recognised as one of Scotland's foremost holiday resorts and boasts a leisure centre and heated outdoor swimming pool.

Though no longer a substantial fishing port, it retains much of historic interest with the ancient Tolbooth close by the harbour and the majestic fourteenth century fortress of Dunnottar on the cliff tops to the south of the town.

### 2.2 Recent History

Stonehaven Harbour is controlled and managed by Aberdeenshire Council who retain responsibility for its upkeep, maintenance and management. Their Harbour Master is also responsible for two other, smaller, harbours South of Stonehaven.

Apart from nominal income derived from leisure vessels mooring within the harbour and a very small number of small commercial fishing boats, regular income is derived from the day-to-day operations of SCI, who are now based at the north end of the Harbour and utilise its outer basin for their survival craft training. Annual income in the region of £30,000.00± falls significantly short of the income required to maintain and sustain the Harbour and has required increasing supplemental spending by Aberdeenshire Council over each of the past five years, or more.

Within the past four years Stonehaven Harbour has had to withstand significant high wind and sea states on at least three occasions. These are caused by local and regional weather conditions combined with anomalous tidal states. Given the history of storm damage sustained by the Harbour these events are not unusual and are likely to persist.

### 2.3 Infrastructure



Structurally, Stonehaven harbour consists of four piers or walls.

First constructed in 1607 and remaining relatively unchanged until 1812, it consisted of only the

North Pier (Net Pier). However, it was rebuilt a number of times due to storm damage.

In 1812 Robert Stevenson was contracted to design improvements to the harbour which included the blasting of the rock basin and construction of the South Pier. Construction work commenced in 1826.

In 1877 the Old Pier was extended to form an inner harbour and in 1908 the breakwater was finally completed.

*Unfortunately we were unable to access any significant historical construction or survey information and our research was limited to fairly recent infrastructural inspection and condition reports, together with anecdotal evidence of structural defect and our own on-site inspection of the harbour. We have had to rely heavily upon Dive Surveys undertaken between 2011 and 2015.*

For ease of reference we will split the Harbour into its component infrastructures and basins:

### **2.3.1 Outer Breakwater**

Successive inspection and Survey reports since 2011 report significant undermining on the outside of the outer breakwater. Whilst this was not found in the 2014 inspection report, the surveyor's explanation was that the void was buried in silt.

The 2014 Survey Report indicated that on '*..... the inside of the outer breakwater there are a number of large voids and areas of undermining which require repair and should be considered high priority*'. Similar remarks are contained within preceding survey reports, suggesting that required on-going maintenance is, either ineffective, or not taking place.

Our visual inspection of the 'above water' areas of the outer breakwater confirmed the generally poor to moderate condition of the structure.

### **2.3.2 Net Pier**

The latest survey report indicated that the '*.... steps at the corner of Net Pier are in very poor condition and should be cordoned off (to) prevent public access.*

The report indicated that the Net pier '*.....is generally in a good state of repair now further to repairs undertaken in 2013*'.

Our visual inspection confirmed the moderate to good condition of the Net Pier, though this was limited to visual inspection only. However our inspection of the 'Sheet Piles' refacing the end of

the net pier indicates significant corrosion and degradation and whilst we were unable to examine their base, we anticipate significant deterioration in that area.

### **2.3.3 South Pier**

The end of South Pier has been refaced with sheet piles and these piles below MLWS are in very poor condition with corrosion, as indicated by successive surveys since 2011.

The general condition of all Sheet Piling within the harbour is, in our view, poor due to corrosion and degradation.

Specific damage to the South Pier was indicated in the latest survey '*..... towards the outer knuckle at the end [which] has three voids in the concrete and also four holes in the sheet pile*',

The latest survey also indicates that '*.....the outer masonry face of South Pier has significant loss of grouting, approximately 100 sq. m of masonry has no grout between the blocks. There is minimal movement in the block work, however, there are a few blocks that are starting to move and one has moved circa 200mm. There is one small void at the toe of the wall which should be filled when the grouting is completed.*'

### **2.3.4 Fish Jetty**

The 2014 survey indicates that '*.....the Fish jetty has also had the end of the pier refaced with steel sheet piles and these are in similar condition to those of South Pier, in that they are suffering from heavy corrosion with loss of section with holes in places*'.

In summation, Stonehaven Harbour Infrastructure is showing degeneration, degradation and deterioration commensurate with its age and situation. Contributing to its current condition may also be a lack of sustained repair, restoration and routine core maintenance.

### **2.3.5 Middle Basin**

The latest survey report indicates that '*.....the Middle Basin has no significant defects*'.

### **2.3.6 Inner Basin**

The latest survey report indicates that '*.....the Inner Basin has no significant defects*'.

### **2.3.7 Outer Basin**

The Outer Basin is not directly referred to in the latest survey report, however our own enquiries indicate that there is significant 'silting' occurring close to the entrance to the Middle basin. Anecdotal evidence suggests that this is a recurring situation, historically dealt with by commissioning routine dredging of the outer basin on a biennial or periodic basis.

## **2.4 Required Repairs**

Given the recurring nature of the deterioration discovered by successive surveys, some indication of the types of repairs required is useful and has been include here:

### ***Breakwater***

*As detailed in the Defect Spreadsheet there are a number of substantial voids that are undermining the breakwater that should be addressed. A further inspection should be conducted on the outer side of the breakwater to check for the presence of undermining that was previously reported but not found on this inspection. These repairs are considered high priority and should be undertaken ASAP*

### ***Net Pier***

*Net Pier is generally in good condition having evidence of recent repairs to the sheet piles at the end of the pier.*

### ***South Pier***

*There are a large number of voids in the sheet pile area of South Pier (ref. D21 to D28). The piles are considered to have reached their life expectancy and a method to replace or reface the complete sheet piled area should be considered.*

*The losses of section on the pile are significant and one void (D22) should be repaired as a matter of urgency, as it is 1m deep. We would recommend that traffic or heavy plant/machinery is prohibited to a distance of 10m from the edge of the sheet piles.*

*The outer masonry face of South Pier has a significant loss of grouting, this should be repaired in a timely manner to ensure that fines are not lost from within the pier which will lead to subsequent block movement.*

*There is one small void at the toe of the wall which should be filled when the grouting is completed. All of the grouting and the small void can easily be repaired on low spring tides as splash work.*



**Fish Jetty**

*There are a large number of voids appearing in the sheet piles of Fish Jetty (ref. D29 to D34). The piles are considered to have reached their life expectancy and a method to replace or reface the complete sheet piled area should be considered.*

*We would recommend that traffic or heavy plant/machinery be prohibited to a distance of 10m from the edge of the sheet piles.*

**Storm Gates**

*Divers inspected the storm gate channels on both South Pier and Fish Jetty and have noted that the bottom channel is buried in approximately 300mm to 500mm of hard compacted silt. The locating channel on Fish Jetty is heavily corroded with sectional loss and is loose in places.*

**2.5 Usage and Costs**

As previously indicated, the harbour capacity is limited with a waiting list for vessel berths. A limited number of fishing boats utilise the harbour, both for berthing and catch delivery. The only industry within the harbour is from SCI whose training base is located on the north end of the harbour and who utilise the outer basin for their training delivery and vessel moorings etc.

Consequently income to the Harbour authority is limited with little scope, in its current format, for increases, other than in the form of berthing fees.

The following is a year on year breakdown of income and expenditure for the past 5 years taken from Aberdeenshire Council's audited budget reports:

<b>Financial Year</b>	<b>Income</b>	<b>Expenditure</b>	<b>Net Expenditure</b>
2013 / 2014	41,318.00	143,282.22	125,440.76
2012 / 2013	37,603.00	97,523.00	59,920.00
2011 / 2012	32,847.00	68,313.00	35,466.00
2010 / 2011	30,561.00	95,013.00	64,451.00
2009 / 2010	30,814.86	66,795.33	35,980.47
<b>Five Year Totals</b>	<b>173,143.86</b>	<b>470,926.55</b>	<b>321,258.23</b>
<b>Year one and Five % Increase</b>	<b>25.42%</b>	<b>53.38%</b>	<b>71.89%</b>



The upward trend is immediately obvious, though increases in income are, significantly, from increased charges rather than substantive increases. The Expenditure and Net expenditure trends are equally apparent and, given the amount of repair work not completed, are quite concerning.

### **3. Project Outline**

Our interpretation and starting point for our Feasibility Study and this Report was that STP required a sensible, reliable 'potentials' based examination of the feasibility of development at Stonehaven Harbour, which could then be utilised to move forward according to the determination of STP and consensus within the community

PJ Consulting & Associates approached this project on a 'First Step' basis. Consequently actions which are more readily catered for within the 'Second or Development Stage' of such a project are excluded.

We have deliberately excluded any of the full 'Regulatory Agency Consultations' which should preface a 'Development Plan'. These should be sought at a Development Stage.

#### **3.1 Preparatory Research**

Having established the core requirement, we immediately commenced background research, preparatory to our first 'on-site' meetings.

Following our 'on-site meeting in January 2015, we continued gathering as much documentary and historic data and information as was available. Included within this work was meeting with key personnel within Aberdeenshire Council Services and access from them of relevant information.

Access to Aberdeenshire Council held data and support whilst readily available, including technical and engineering data, both current and historical, was extremely limited in range, scope and chronology, with consequent questions regarding its definitive accuracy.

Consequently, a great deal of reliance had to be placed upon anecdotal and historical precedent evidence with regard to key indicators.

A number of visits were made to harbours within the North East of Scotland, together with meetings with their Managers / Harbour Masters who proved a useful source of anecdotal information.

## **3.2 Community Input**

A key element of the Feasibility Study remit was inclusion of views, opinion and information from individuals and groups closely associated with Stonehaven Harbour, including residents of the harbour area.

In this exercise, the Harbour Development Feasibility Steering Group was deemed to be the best conduit for communicating with and receiving responses from the interest groups and individuals.

The Steering Group proved very effective in this and delivered a matrix of submissions (See Appendix 1), from which a number were selected to present to ourselves, in person. The presentations were completed in one day and proved extremely informative, if not enlightening.

(On behalf of PJ Consulting and Associates I would like to thank all those who contributed to that consultative exercise.)

As may be seen from the Matrix, submissions were generally informed and informative and a surprising number held common themes.

Two in particular deserve special mention due to their pertinence and potential impact upon any future plans for the Harbour.

### **3.2.1 The Tolbooth Museum (and Tolbooth Restaurant)**

This submission included an outline and concept drawing for a significant extension and expansion of the Tolbooth Museum and possibly the restaurant above. The project is moving ahead and must be considered when planning any harbour regeneration.

### **3.2.2 Stonehaven Sea cadets**

This submission outlined the long history and strong support for the Sea Cadets in Stonehaven and their routine use of the harbour. More pertinent was their plan to re-locate to a property within the harbour environs which was scheduled to be renovated and upgraded to facilitate this move and an increase in their core numbers and membership. A significant sum of money has been raised for that purpose. This again is a project which should be factored in to any harbour regeneration project.

A recurring theme throughout all the submissions received, whether in support or opposition to any development at the harbour was the iconic, idyllic, historical and traditional nature of the existing harbour and the need to retain as much of that, if not all, in any regeneration plan

### **3.3 On-site Inspections**

Several visits were made to Stonehaven Harbour where we were able to inspect the infrastructure, view existing facilities and examine the condition and layout of moorings, berths and individual impact factors. (None of these visits included any technological examination of infrastructure beyond viewing the readily available signs of deterioration)

#### **3.3.1 Salient Factors**

A number of salient factors have a bearing upon potential solutions:

##### ***Vehicle Access***

There is limited vehicular access all-round the harbour, especially where vehicle parking is concerned. Any project must account for potential increases in vehicular access with a commensurate increase in parking. We could not identify a readily available solution to this issue though some potential exists to convert a nearby gas works site into a car park.

##### ***Welfare Facilities (toilet, showers and washing facilities)***

During our visits none of these basic welfare facilities was available for harbour users. We were assured that temporary facilities are installed for the summer months, but these were pending during our site visits.

##### ***Electricity & Fresh Water***

Access points for these basic utilities are currently very limited.

##### ***Vessel Berthing***

Berthing currently consists of a number of ground moorings, a limited access to floating pontoons and 'hard berths' alongside the piers. As with many such historic harbours there appears to be no planned organisation of these, giving the appearance that the current layout has randomly evolved over time. Most berthing within the Inner Basin requires vessels to 'dry out', whilst berths within the Middle Basin are seasonal and were not 'in-situ' throughout our visit.

##### ***Fuel & Bunkering***

There is no permanent fuelling or bunkering facility currently within the harbour.

### ***Commercial Vessel Hoist or 'Lift out'***

Whilst the Middle basin does have a stone and concrete slipway that facilitates the launch and recovery of small craft, there is currently no facility for hoisting out the larger vessels berthing within the harbour. Consequently access to these vessels for any kind of maintenance work requiring 'drying out' is tide dependent or requires bringing in a suitable crane.

The SCI facility is equipped with davits and hoist, which is restricted in use to their operational needs.

### **Development Land**

Traditionally, regeneration of harbours and port facilities is enabled by significant shore side development from which solution providers achieve their Return on Investment (ROI). Having examined the harbour and its environs thoroughly, we are unable to identify any readily available development opportunities or potential, from which such ROI might be achieved.

### **Subsea Conditions**

Other than general information regarding the 'bottom' of the harbour basins and Stonehaven bay, beyond the outer breakwater, no specific bathometric data was available for inclusion with or consideration of, during preparation of this report.

Such a bathometric study would need to be completed prior to initiation of any substantive development plan.

### **3.3.2 Weather & Tide**

From its first days as a small Harbour (circa. 1607) Stonehaven Harbour has experienced damage and destruction due to heavy storms. This is a recurring item throughout its history, right up to today and will continue to be. **Any regeneration or development of the Harbour MUST account for this contingency within its core planning.**

The following link is included which provides an excellent example of the potential ferocity of such storms.

<https://www.youtube.com/watch?v=02qhjbzYvE4>



A realistic outline of any regeneration, including potential capacities, may only be achieved by taking into account prevailing weather, tide and wind conditions and allowing for potential 'critical weather events'.

#### 4. Options

There is a generally held perception that any kind of harbour regeneration program must include a marina, usually with commensurate shore side development as an enabling factor.

PJ Consultants and Associates do not subscribe to that view, hence our Feasibility Study looked at several alternatives, including a full-scale marina development.

When determining suitable options we have tried to ensure a realistic approach, rather than merely positing what 'could be done', since, given infinite resources anything is possible, whilst reality is usually a good deal less accommodating.

##### 4.1 Costs

A key factor in any regeneration or re-development program is cost. Assessing an accurate definitive cost for this type of work is virtually impossible due to the number of 'impact factors'. These include, but are not limited to:

- When the actual work is conducted, relative to the time it was costed?
- The process for contractor appointment?
- Pre-development technical surveys, which may discover previously unknown conditions or circumstances, which impact on cost?
- Effectiveness of tender/negotiated contract determinations?
- Timescale for completion?
- Detailed scope of work?

Consequently, where we have indicated likely costs we do so as a broad indication or guide only by creating 'indicative cost bands' into which each option falls. Where individual items are salient, we include cost bands for those tasks.

#### Cost Bands

Bands	Indicative Cost in GBP*
Band 1	50,000 – 100,000
Band 2	250, 000 – 500,000
Band 3	500,000 – 1 million
Band 4	1 million – 5 million



Band 5	5 million – 10 million
Band 6	10 million - 20 million
Band 7	20 Million +

- Wherever possible cost indications will include an indication of where within the 'Band' each option falls.

**4.2 Do Nothing:**

This actually means continuing in the current manner of performing absolutely essential, but minimal repairs for the foreseeable future and taking no action to improve or increase income derived from the harbour other than by berth fee increases in line with inflation.

At the core of any 'do nothing' program is the requirement not to effect any meaningful repairs to the existing infrastructure. This would leave the existing harbour with structurally insecure infrastructure, including the outer breakwater, which will inevitably be breached and possibly be destroyed and in need of major repairs due to strong Easterly gales or even normal sea conditions over time.

The actual time it will take for the infrastructure to be seriously damaged or destroyed is moot and variable depending upon which pier is being considered, however, the outer pier could be seriously damaged / destroyed along a significant percentage of its structure, at any time and is certainly the most 'at risk' of the Harbour structures.

**The recurring annual cost estimate of a 'do nothing' policy as describe above, would be within Cost Band 1 depending upon continuing degradation and degeneration.**

**Recovery following a critical weather event resulting in partial or total destruction of the outer breakwater/pier would result in costs within the upper range of Cost Band 4.**

**4.3 Develop a 'Commercial' Marina:**

Whilst the development of a commercial marina was a factor within the 'brief' for our Study and this report, this was predicated upon the already acknowledged perception of such developments as the only potentially viable solutions for 'failing harbours'. Unfortunately the practicalities of such developments rarely support the wishes of harbour operators or developers.

A key element for any Marina Development is operational capacity. A realistic outline of potential operational capacity within Stonehaven Harbour, allowing for all salient factors, including weather, tide and wind conditions suggests a limit of forty five (45) pontoon berths for the inner basin and thirty five (35) to a maximum of forty (40) in the middle basin, depending upon scale of development and sizes of craft catered for. This would be a reduction in capacity from the current berthing levels, with consequent reduction to annual berthing income.

Any such 'marina' program will be extremely costly. The topographical and developmental limitations of the Harbour, in addition to the obvious lack of potentially enabling shore side or peripheral development make it extremely challenging to envisage how the necessary financial investment may be accessed, or more importantly, recouped.

Before any 'marina' is contemplated certain 'critical steps' are essential.

### **4.3.1 Critical Steps**

Construction of a full commercial marina within the environs of Stonehaven Harbour requires a number of critical steps to be completed first and requires a capital intensive plan to finance repairs to:

- a. The outer breakwater.
- b. The South pier.
- c. The Net Pier
- d. The Fish Pier
- e. Storm Gates/Booms
- f. A new outer breakwater.

Each of these items is addressed as an individual 'Option' later in this report.

### **4.3.2 Scope of Work**

Within the scope of actual work required for a full marina development are the following, which pre-suppose completion of the above 'critical Steps':

- a. Dredging and blasting inner, middle and outer basins to increase 'Chart Datum' depths.
- b. Construction of a suitable lock system between the outer basin and the middle and inner basin to ensure a constant minimum depth within the middle and inner basins.

- c. Installation of suitable floating pontoons with individual vessel berths for a variety of small to medium craft.
- d. Securing and making safe the perimeter of the inner and middle basins adjacent to the Harbour roads
- e. Installation of dedicated toilets, showers and laundry facilities.
- f. A complete upgrade of 'utilities' within the Harbour, including installation of dedicated individual berth access points.
- g. Suitable vehicle access and parking arrangements.

These should not be considered as a definitive list, rather as an indication of items within a complete 'scope of work'. They take no account of factors which impact upon any re-development, post construction commencement. (Given the age and history of Stonehaven Harbour it is unlikely that unpredicted 'issues' effecting construction will not arise, each of which will impact completion and costs.)

#### **4.3.3 Timescales**

A realistic estimate of the time required to complete a full marina development, including all the above 'Critical Steps' and 'Scope of Work' items, allowing for local rules, contractor best practice, climatic; weather and tidal impactors and 'hours of work' impact upon residents, is between two and a half to five years, depending upon the extent of development undertaken.

**Such a 'Marina Development', excluding the Critical Steps (para.4.3.1) would fall within the mid range of Cost Band 6.**

#### **4.4 Mitigation Plan**

There is little, if any doubt that a 'do nothing' approach will result in significant deterioration or destruction of the existing outer breakwater and subsequently the inner piers.

Destruction of the outer breakwater would result in significant, if not catastrophic impact upon Harbour operations and viability. All current commercial activity, including fishing and SCI training operations would be seriously curtailed, if not prevented.

Consequently some kinds of 'Mitigation Measures' are essential if Stonehaven Harbour is to survive, let alone thrive.

These Mitigation Measures should be focused upon refurbishing and protecting the existing infrastructure and fittings, which include:

- a. The outer breakwater.



- b. The South Pier.
- c. The Net Pier
- d. The Fish Pier
- e. Storm Gates/Booms

#### **4.4.1 The Outer Breakwater**

This requires substantial work to repair and refurbish all voids and undermining on all aspects of the pier. A substantial program of surface repair and replacement should also be completed. Having done so, a substantial outer armouring program should be undertaken utilising 'tetrapod' or 'Xbloc' type armouring blocks as opposed to 'Rip Rap' or Rock Armour, due to the ferocity of local critical weather conditions and the likely impact on rock armour of these storm waves.

**This refurbishment and breakwater armouring would probably fall within the upper ranges of Cost Band 4**

#### **4.4.2 Inner Piers (South Pier; Net Pier.)**

The South and Net piers will require refurbishment and repairs in line with recent dive surveys. Substantial refurbishment and replacement of the existing 'sheet piling' should be undertaken, where required and the outer facing sides of both the inner piers need to be armoured as protection from tidal and critical weather incidents. The use of 'Rip Rap' and/or Rock Armour would mitigate the cost of this work.

**This refurbishment and armouring would probably fall within the lower ranges of Cost Band 4 for each pier.** (Where contracts are negotiated as combined packages, further 'per pier' reductions might be achieved which would reduce the 'per pier' cost to the upper end of Cost Band 3)

#### **4.4.3 Fish Pier**

Refurbishment of the 'Fish Pier' should be undertaken in line with the recent Dive Surveys with particular attention to any undermining. Armouring should not be necessary.

**This work would probably fall within the lower ranges of Cost Band 3**

#### **4.4.4 Storm Gates/Booms**

The existing storm gate channels on both pier ends together with the bottom channel should be replaced. The existing boom configuration should be refurbished, with damaged

components being replaced. A program of recurring silt removal should be added to annual maintenance costs to ensure the viability of the Storm Gates.

Consideration was given to replacing the Storm Gates or 'booms' with a more 'up-to-date' solution. However this has been rejected due to the increased costs associated with such up-dated solution.

**This work, excluding the recurring annual costs, would probably fall within the lower range of Cost Band 3.**

#### **4.5 New Outer Breakwater**

A basic principle of 'Harbour Development' is the requirement to protect ones investment. Given the limitations of Stonehaven Harbour design and construction there is probably only one method to fully protect the Harbour and any new internal or marina construction from climatic and critical weather events.

The existing outer pier will not provide sufficient protection from critical weather events, as has already been experienced.

An effective barrier in the form of a complete new 'outer pier' constructed from the base of the cliffs on the South East aspect of the Harbour entrance, positioned to optimize its angle to the Easterly gales, which have the most destructive impact upon the Harbour and designed to a suitable scale and suitably armoured is the only potential solution we can perceive.

The following work would need to be undertaken prior to any such construction:

- a detailed hydrographic survey of the site;
- a geotechnical investigation of the seabed;
- a wave height investigation or hindcasting;
- a material needs assessment; and
- a cross-sectional design of the structure.

Whilst the impact and benefits of such a construction would be significant, including its effect on flooding, creation of a deeper water basin with all its benefits, securing of the existing Harbour infrastructure and more, the cost of such a structure would be very high and would require an extended capitalization program.

The final costs could be significantly higher depending upon the results of the scheduled pre-construction work listed above.

**The said 'pre-construction surveys and work would probably fall within the upper ranges of Cost Band 3, whilst our best estimate of the cost of the completed 'new outer breakwater' would be within Cost Band 7 or higher.**

## **5. Conclusions**

Our conclusions will address each of the options within para.4 and are based upon realistic potentials rather than 'wishes'.

### **5.1 'Do Nothing'**

Whilst a number of submissions were made which, basically, supported this course of action, the 'do nothing' approach will not achieve long term sustainability for Stonehaven Harbour nor will it ensure the continued viability of its infrastructure or its operations and it would probably result in potentially catastrophic destruction of key Harbour infrastructure.

**As such, we conclude that, for those reasons 'do nothing' is not a viable option.**

### **5.2 Develop a Commercial Marina**

As previously highlighted, given the geographical, topographical and developmental limitations of the Harbour, in addition to the obvious lack of potentially enabling shore side or peripheral development, it is extremely difficult to envisage how the necessary financial investment can be accessed, or more importantly, recouped.

The limits of berth numbers, imposed by the topographical limits of the Harbour suggest that fees derived from such a development would not cover annual operating costs, without pricing them 'out of the market'. (A previous plan introduced by Aberdeenshire Council some years ago grossly overestimates the potential capacity of such a marina, by taking no account of vessel maneuvering and turning circles and area required by their indicated vessel sizes.)

The challenges presented by all of the factors impacting on Stonehaven Harbour effectively preclude any realistic hope of developing a marina within its environs. Pre-eminent amongst

these factors are limited capacity impacting commercial viability, no perceivable 'enabling' development potential, high cost of development and consequent funding access issues.

**Based upon these factors our conclusion is that any realistic potential for development of a commercially viable marina within Stonehaven Harbour is extremely limited and not commercially feasible.**

### **5.3 Mitigation Plan**

The measures highlighted within the 'Mitigation Plan' cited at para.4.4 consist of remedial action which, if not undertaken, will probably result in significant, if not catastrophic, destruction to existing harbour infrastructure. As such it probably sets the 'base line' for any action designed to ensure future viability and potential sustainability of Stonehaven Harbour.

Whilst its adoption and implementation will not guarantee either viability or sustainability, failure to undertake key elements of it will probably guarantee the reverse, namely critical impact upon the continuing functionality of the Harbour.

**Accordingly, we conclude that the Mitigation Plan should form the basis or 'first steps' for remedial action within Stonehaven Harbour.**

### **5.4 New Outer Breakwater**

There is little doubt that creation of a completely new 'Outer breakwater', optimally positioned to withstand and deflect the full force of Easterly gales, consequently providing significant weather and flood protection, an increased berthing capacity for vessel numbers, size and draft and significant improvement to inner harbour security and safety, would be the 'ideal' solution to ensure future sustainability and viability for Stonehaven Harbour.

Unfortunately, the likely cost of construction of such a breakwater is, within the current financial climate and possible investment scenarios, highly unlikely.

Should access to unlimited funding become a realistic possibility, then such an outer breakwater would be a huge 'game changing' development impacting positively upon all aspects of the harbour and its sustainability.

**However, our conclusion is that whilst we recognise the potentials for such a solution, we also recognise the challenges in achieving it and its probable impracticality given current constraints and realistic financial expectations.**

## ***Part B – Economic***

### **B1 Introduction**

This report presents a strategic economic appraisal of the proposal to develop Stonehaven Harbour. The appraisal has been carried out in partnership with PJ Consulting (Technical Consultants) and Waterman's (Environmental Consultants) to outline the headline economic rationale for developing Stonehaven Harbour.

The economic appraisal focuses on two key areas, namely:

- The economic baseline position – to demonstrate the economic and market rationale for developing the harbour; and
- An options appraisal of the emerging proposals for the harbour.

The series of key findings and next steps is set out as a conclusion to this piece of work.

## **B2 Economic Baseline Position**

The economic baseline position of Stonehaven and environs is well known and STP and partners have a robust and detailed understanding of the current opportunities and constraints to future economic growth and local prosperity.

The economic baseline position can essentially be structured into three key areas, these being:

- The policy and strategy position;
- the socio-economic conditions locally, including the visitor market;
- The situation around water based leisure, notably sailing and harbor development at Scottish and North East levels; and
- Potential economic impacts at the regional and local levels

Each of these areas are summarised in this section. Alongside the engineering and environmental baseline position they form the basis for developing the emerging options for the development of Stonehaven Harbour.

### **B 2.1 Policy Overview and Linkages**

The key economic and tourism policies, and their link with the harbor development plans are summarized in the table below.



	Policy Overview	Relevance to Stonehaven	Relevance to Stonehaven Harbour
<b>National</b>			
<b>Government Economic Strategy</b>	Focus on sustainable economic growth, with particular focus on key sector growth including tourism. Supporting rural areas by harnessing the geography of an area to support growth ambitions.	A well known tourist location, especially in regard to Dunnottar Castle. Significant economic growth potential from further tourism demand.	Linking town and key attraction can help enhance destination credentials of the town and wider region.
<b>National Tourism Strategy</b>	Aim to increase tourism volume through higher value tourism, including activity based tourism and tourism throughout the year.	Widening the appeal for tourists includes the Open Air Pool, Harbour and the Castle.	Providing an 'integrated' experience must ensure a 'seamless' link between the tourism assets in the town.
<b>Regional</b>			
<b>ACSEF Economic Strategy</b>	The Strategy centres around delivering better integrated transport and digital connectivity, attracting and developing skills and increasing the promotion and profile of the region.	Providing a seamless experience and raising the quality across all components of each local destination strengthens the overall appeal of the region.	Small weaknesses can affect the overall appeal, especially in an increasingly competitive global and domestic tourist market.
<b>NESTOUR Tourism Strategy</b>	Deliver a consistently high-quality visitor experience, with high standards of facilities, customer service, career opportunities and income levels.	'Castle and Whisky Country' is a key brand being targeted and the strategy also recognises Stonehaven as offering a unique attraction.	The strategy has a stated objective to 'enhance the experience of visitors to North East Scotland by ensuring that they have easy access to a wide range of culture, arts and genealogy events, facilities and experiences.'
<b>Local</b>			
<b>Aberdeenshire Council Economic Development Plan</b>	To create conditions for sustainable economic growth, diversification and regeneration within Aberdeenshire and the wider region by attracting and supporting businesses and industries and developing communities. To develop a sustainable, enterprising and adaptable economy and promote Aberdeenshire locally, nationally and internationally as a location of choice for employment, tourism, living and leisure.	A key strategic priority is 'to promote Aberdeenshire as a key tourism destination in Scotland and improve the visitor experience by strengthening and supporting the tourism industry.' Tourism is identified as one of four key sectors and Stonehaven can help deliver on the destination ambition of the region.	Capitalising on growth markets is a key feature of plan, tourism is clearly one of the cornerstones of the current plan and 'supporting local businesses' is an area in which Economic Development Plan can help unlock local issues and concerns.
<b>Stonehaven Town Partnership: Whole Town Strategy</b>	The strategic goal of the Stonehaven Whole Town Strategy is to enable Stonehaven as a small town to remain a sustainable and thriving community into the future.	The evidence presented in the Strategy confirm the importance of tourism to the town, improving the town's offer and building on it's tourism potential are key features of the Strategy.	The harbour is a key attractor in its own right, and is a key factor many people visit and stay and spend time and money in the town.

## B 2.2 Socio-economic conditions

The North East of Scotland is recognised as an affluent region, with one of the highest GDP per head figures in the UK and EU. The figure below, published by Eurostat, highlights the most affluent areas in the EU, where the North East of Scotland was identified as the 15th most affluent of all EU regions in 2009.

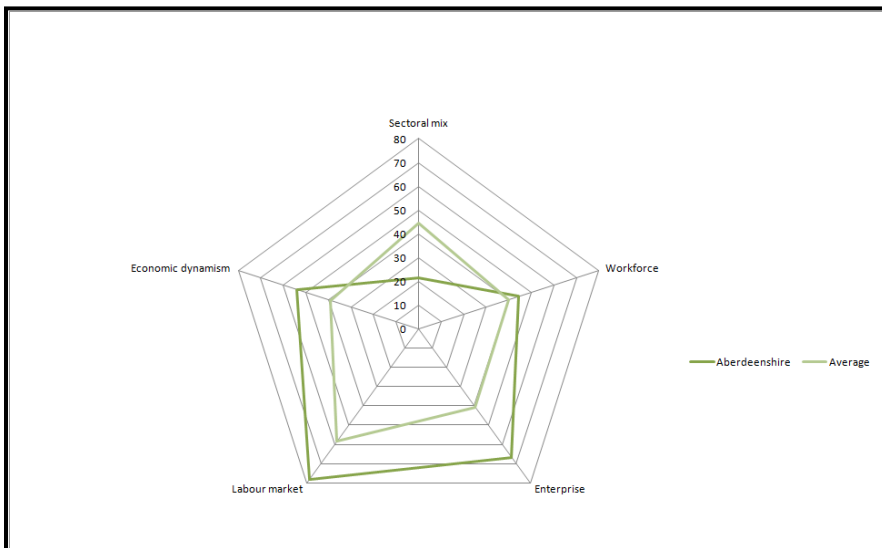
As a local authority area Aberdeenshire is a predominantly rural area in the North East of Scotland. Traditionally, it has been economically dependent upon the primary sector (agriculture, fishing, and forestry) and related processing industries. Over the last 40 years, the development of the oil and gas industry and associated service sector has broadened Aberdeenshire's economic base, and contributed to a rapid population growth of some 50% since 1975.

To maintain current levels of growth the Aberdeen City and Shire Economic Future (ACSEF), a partnership between the local business community and local authority partners, aims to sustain a vibrant business base and build on the success of the oil and gas sector and establish the region as the 'global center of excellence'. The partnership recognises the vital importance of growing the regions other key sectors, namely food and drink, life sciences, and tourism.

A socio-economic model, which measures the performance of each of Scotland's 32 Council areas across five critical determinants of economic strength, confirms the key labour market strength but narrow economic base of the Aberdeenshire economy.

The chart demonstrates Aberdeenshire is a well-structured and advanced economy, with high levels of income, education attainment and employment and lower levels of unemployment and benefit claimants. However, its weak sectoral mix is the obvious economic weakness and recognised opportunity.

### B 2.3 Aberdeenshire's Economy: An Overview



In terms of the performance across four of the five key domains, the Aberdeenshire economy can be seen as having one of the best performing economies in Scotland, the UK and indeed the EU. Regional unemployment (March 2015) at 1.2% for the City and 0.8% for the Shire is well below the Scottish (2.4%) and UK (2.0%) rates. However, the figure validates the important economic opportunity associated with broadening the area's economic base, and this is a known objective of ACSEF.

The regional economy is forecasted to continue to grow, and in population terms according to official forecasts the City is forecasted to grow by 25% in the period to 2035, and the Shire is forecasted to grow by 22% over the same period.

#### B 2.3.1 The Local Economy

Stonehaven is the largest settlement in the Kincardine and the Mearns (K&M) sub-region. Stonehaven's population increased by 13% between 2001 and 2011, the regional increase was





12%. Only the smaller K&M settlements of Laurencekirk (+47%), Drumoak (+21%) and Gourdon (+21%) grew at faster rates than Stonehaven. The town's population increased from around 9,500 to almost 11,000, only Peterhead (18,000), Fraserburgh (12,500) Inverurie (11,500) have higher populations in terms of settlements in Aberdeenshire.

Transport links with Aberdeen have encouraged very rapid population growth; the reopening of Laurencekirk Station has exceeded predictions. Portlethen and Stonehaven have greatly expanded and additional industrial and business development is anticipated.

In terms of industry sectors the following table demonstrates the breakdown of the K&M economy by industry sector. The table highlights that almost 40% of the industrial profile can be grouped into three broad headings, namely 'Mining, quarrying & utilities', 'Manufacturing and 'Professional, scientific and technical' jobs.

**B 2.3.2 Kincardine and Mearns: Industry Profile**

<b>Industry Sectors</b>	<b>Number of Employees ('000s)</b>	<b>% Of Total</b>
Agriculture, forestry & fishing	0.1	0.6
Mining, quarrying & utilities	1.6	10.4
Manufacturing	2.2	14.0
Construction	0.7	4.7
Motor trades	0.2	1.2
Wholesale	0.8	5.2
Retail	1.2	8.0
Transport & storage (Inc. postal)	0.6	3.9
Accommodation & food services	1.0	6.7
Information & communication	0.1	0.7
Financial & insurance	0.1	0.4
Property	0.1	0.3
Professional, scientific & technical	2.3	15.0



Business admin & support services	0.8	5.2
Public administration & defense	0.5	3.5
Education	1.4	9.0
Health	1.2	8.0
Arts, entertainment & recreation	0.5	3.2
All Sectors	15.4	100.

The average salary, according to CACI Paycheck data in 2012, in Stonehaven is £32,971, compared to the Aberdeenshire average of £31,851.

The table below highlights the proportion of the working age residents that work within the defined travel to work area (TTWA). This suggests that a higher proportion of residents in Stonehaven work outside the local area, than compared to the K&M and Aberdeenshire pictures. Or in other words around two-thirds of Stonehaven residents work outside the Stonehaven TTWA.

**B 2.3.3 Workplace of Residents –Travel to Work**

	Stonehaven	K&M	Aberdeenshire
% Of Total Residents Aged 16-74	34.7%	43.5%	46.6%

In terms of the latest full year average unemployment figures (2012), the unemployment rate in Stonehaven (1.2%) is slightly above the K&M rate (1.1%) but slightly below Aberdeenshire average (1.3%). All rates are considerably lower than the comparable Scottish rate, 4.0%. This confirms that the area has been less affected by the global recession.

In terms of house prices, the Stonehaven average (2011) was around £210k, which was the same as the Aberdeenshire average but below that of the K&M average of £235k.

Overall, Stonehaven can be deemed to be a well performing economy, which has continued to expand over the past decade. Although the area does not show signs of any significant detrimental impacts of the recession, the area has lagged behind other local areas in terms of employment, house prices and is more reliant on jobs outside the local area.



## B 2.4 Sailing in Scotland

Scottish Enterprise commissioned independent research (2011) to 'Establish the current contribution the sailing tourism sector makes to the Scottish economy and to highlight what potential there is within the sector with investment in new 'product' to grow GVA impact. Although this report was conducted four years ago, it is recognised as a key piece of research as SE and partners are bought into supporting the recommendations to achieve the potential economic benefits associated with sailing and sailing tourism.

The research programme was designed to uncover the current dynamics of the market in each area including; supply; demand; future potential gaps; and current consumer behaviour. The following geographic segmentation was used to guide the research programme and present the data gathered. They reflect the geographies of the main sailing economies in Scotland.

<b>'GEOGRAPHY' OF THE SECTOR</b>		
<b>Strategic Economic Areas</b>	<b>Regional Operational Zones (Sailing Grounds)</b>	<b>Location</b>
A – Clyde	1	Clyde Estuary
	2	Solway
B – West	3	Argyll
	4	Ardnamurchan to Gairloch
	5	Outer Hebrides
C – North	6	Gairloch – Helmsdale
	7	Orkney / Shetland
	8	Helmsdale – Peterhead
D – East	9	Peterhead – Fife Ness
	10	Fife Ness – Berwick

It is interesting to note that Stonehaven falls within the 'East' Strategic Economic Region, in that it lies south of Peterhead but north of Fife Ness. The research did not specifically assess the 'North East', although it can be assumed for this assessment that Stonehaven sits within both the 'North' and 'East' Strategic Economic Areas.

The research found that there is a total berthing / mooring capacity available across the Country for 12,500 vessels. The geographic profiling clearly indicates the clustering and concentration of facilities on the Clyde and on the West Coast when compared to the North and East Coasts.

Analysis of official data indicated that over the last five to ten years annual growth in the sailing sector in each of the areas could be considered to be at around the following levels. It can be seen that all areas in Scotland witnessed a considerable growth over the period from 2000, notably the North and East recorded a 7% growth over the five-year period to 2009.

<b>ESTIMATE OF ANNUAL COMPOUND GROWTH IN 'CORE' MARINA OPERATIONS<sup>(a)</sup></b>		
<b>Area</b>	<b>Over the 10 Year Timeframe (2000 – 2009)<sup>(b)</sup></b>	<b>Timeframe (2004 – 2009)<sup>(c)</sup></b>
Clyde	6.1%	7.6%
West	7.0%	5.6%
North & East	4.7%	7.0%

If the future growth rates in strategic infrastructure / demand outlined in the research are to be achieved, the research found that the following levels of infrastructure stock will be required to service any anticipated growth in demand.

<b>FUTURE RESIDENT AND VISITOR BERTHING CAPACITY</b>						
<b>Area</b>	<b>Future Resident Berthing Capacity</b>			<b>Future Visitor Berthing Capacity</b>		
	<b>5 Years</b>	<b>10 Years</b>	<b>Growth in Berths Required in 10 Years</b>	<b>5 Years</b>	<b>10 Years</b>	<b>Growth in Berths Required in 10 Years</b>
Clyde	5,550	6,821	2,094	783	1,000	356
West	3,303	3,663	617	755	964	343
North	2,042	2,485	739	328	419	149
East	1,575	1,825	426	151	155	7

The potential future “demand” position within the sector was modeled to inform the assessment of future economic impact that the sector might achieve.

<b>FUTURE DEMAND PROFILE</b>								
<b>Area</b>	<b>Five Years Out 2014</b>				<b>Ten Years Out 2019</b>			
	<b>Resident Berths Occupied</b>	<b>% Increase on Current</b>	<b>Visiting Boat Nights<sup>(a)</sup></b>	<b>% Increase on Current</b>	<b>Resident Berths Occupied</b>	<b>% Increase on Current</b>	<b>Visiting Boat Nights</b>	<b>% Increase on Current</b>
Clyde	5,162	17%	59,911	22%	6,344	44%	76,463	55%
West	3,039	8%	107,408	12%	3,370	20%	137,083	43%
North	1,940	17%	18,872	18%	2,360	42%	24,087	51%
East	1,566	12%	6,643	3%	1,804	29%	6,811	5%
<b>TOTAL</b>	<b>11,706</b>	<b>14%</b>	<b>192,835</b>	<b>15%</b>	<b>13,878</b>	<b>35%</b>	<b>244,444</b>	<b>46%</b>

The research highlighted that in the North, the emphasis in the future needs to be on the creation of a ‘string of pearls’ and visitor nodes to encourage sailing itineraries in the area to attract more foreign boats and provide opportunities and appeal for local craft. Any future development in the East is of less strategic importance as market conditions are primarily influenced by a very local domestic market suggesting less opportunity exists in national strategic terms.

The research concluded that competition in the sailing tourism sector is growing nationally at the UK level and across the World and Scotland will need to take action to both maintain its current position in the market and grow its share in the future. Others are developing new product and targeting markets similar to Scotland. This calls for Scotland to both address the potential infrastructure shortfalls in the future but also to proactively target promotion of the destination at those sectors and geographies that offer greatest opportunities in the future.

The above research findings suggest there is a market opportunity in the East and North, albeit to a lesser extent than the mature market opportunities afforded in the Clyde and West. As well as developing new assets and infrastructure it is clear that a wider regional strategy – and development of a ‘String of Pearls’ – is also important in order to build a competitive offer and develop water based leisure activities in the North East.

#### **B 2.4.1 Potential Economic Impacts**

The net economic impact is derived from the income generated by local and visitor boat nights, and the research found that the average expenditure per boat night was around £130. At a regional level, the research found that the net economic impact of realising the ambition for sailing tourism is expected to be around £1.5million, safeguarding around 36 jobs at the regional level.

The economic impact at the local level is harder to measure at this stage of the development, however it should be noted that the nature of sailing and sailing tourism suggests economic impact should be considered at the regional level. Notwithstanding this point, the potential for a 120-berth marina will have a marked impact on the local area. Assuming the average expenditure per boat night of £130 this is expected to generate a considerable financial impact locally. The actual impact will be dependent on build-out rates, occupancy (by local and visitors) and the actual spending patterns of marina users, where there will be an obvious added financial impact associated with visiting boats.

On the basis that 25% of the berths (30 berths) will be utilised for visiting boats and that these berths will achieve 25% occupancy, this equates to around 2,800 boat nights per annum, which equates to a potential cash injection at the local level of around £365k. The income derived by local boats will be marked; the 90 ‘local’ berths paying berthing fees of around £1,000 for example would generate £90,000 alone. Other financial impacts associated with upkeep and maintenance of boats and their purchases will also add an economic impact, the construction work alone would also benefit the local community significantly. A more detailed economic impact assessment would be required prior to any future funding bids of a preferred option.

Surprisingly little empirical research is available on the employment impacts of marinas on economic development. Ex-ante studies funded through EU programmes provide a variety of projected revenue generation and impact estimates and highlight the role of marinas in relation to tourism, generation of spend by boat owners and contribution to the quality of life. Ex-post studies indicate that a 400 berth Marina in Pwllhelli is likely to have generated over 280 jobs. An older

study of a marina in Ramsgate suggested job creation of 170. A more recent economic impact assessment of a relatively similar proposal, a 90-berth marina in Kings Lynn, estimated the local employment impacts to be around 14 new jobs. There is no economic impact assessment of completed marinas in Scotland, such as the investment in the Arbroath Marina.

There are a range of wider more strategic economic benefits, including safeguarding the harbour's current business activities, promoting the attractiveness of the harbour as a tourism destination, growing other sectors as a result of investing in the harbour, potential new onshore developments and enhancing the overall attractiveness of Stonehaven as place to live, visit, invest and work.

### **B 3 Option Appraisal**

As part of the option appraisal process, each of the five options will be assessed against six criteria, which are linked to the original project objectives. The original options have been slightly tweaked in order to enable a comparable assessment across each option, however they are broadly in line those appraised as part of the technical assessment. The options assessment is completed to help advise on the identification and selection of a preferred option, or options. Potential funders will be interested to know how a preferred option was defined, and this scoring assessment is a standard method for appraising emerging options at feasibility stage.

In terms of the six scoring criteria, we have assumed that the overarching vision for the Stonehaven Harbour to be safeguarded for future generations and the cost of delivery will be attached the greatest weighting (25%). Supporting economic ambition and the encouraging environmental sustainability, all share equal importance, and have therefore attached a weighting of 20 per cent. Finally we consider the timing and deliverability of the project in terms of funding support is also important and have attached a weighting of 10% to this criteria.

- To safeguard Stonehaven Harbour to future generations – This measures the extent to which each of the five options will safeguard the integrity of Stonehaven Harbour;
- Cost of delivery – The five proposed options vary significantly in terms of delivery costs, and this will therefore be an important factor to consider in the decision making process;
- Supporting the town's economic ambition – This will measure the extent to which each of the options promotes the economic objectives of Stonehaven as a leading leisure and tourism destination;
- Encouraging environmental sustainability – This will measure the ability of each option to help safeguard the environment and promote the outdoor activity and events.
- Timing and deliverability in terms of funding – this rates the likelihood of delivering the project in light of current budgetary pressures and the current status of the external funding environment

The six criteria are summarised in the table below:



Criteria	Weighting
Safeguard the harbour	25%
Cost of delivery	25%
Supporting economic ambition	20%
Environmental sustainability	20%
Deliverability and timing	10%

The options can be summarised as:

The first of option is a ‘Do Nothing’ option. This option assumes that Aberdeenshire Council and partners safety and regulatory commitments to the harbour, but no future capital expenditure is committed. Only improvements to meet any new regulations and to comply with safety standards are progressed.

A ‘**Do Minimum**’ approach, this actually means continuing in the current manner of performing absolutely essential, but minimal repairs for the foreseeable future and taking no action to improve or increase income derived from the harbour other than by berth fee increases in line with inflation.

To ‘**Develop a Commercial Marina**’, as outlined in the report this includes the construction of a full commercial marina within the environs of Stonehaven Harbour. This requires a number of critical steps to be completed first and require a capital intensive plan to finance repairs to:

- a. The outer breakwater.
- b. The South pier.
- c. The Net Pier
- d. The Fish Pier
- e. Storm Gates/Booms

The construction of ‘A new Outer Breakwater’, acting as an effective barrier in the form of a complete new ‘outer pier’ constructed from the base of the cliffs on the South East aspect of the Harbour entrance, positioned to optimize its angle to the Easterly gales, which have the most

destructive impact upon the Harbour and designed to a suitable scale and suitably armoured is the only potential solution we can perceive.

The 'Do Maximum' option includes the development of the 'Commercial Marina' as well as the construction of the 'New Outer Breakwater'.

### **B 3.1 Assessment of options: Safeguard the Harbour**

The '**Do Nothing**' offers little scope to safeguard the Harbour in Stonehaven. This option is therefore given a negative score due to the risk it will have in undermining the future of the Harbour. Similarly, the 'Do Minimum' option also undermines the future of the Harbour and is therefore given a score of zero.

The '**Commercial Marina**' option can play a role in safeguarding the Harbour, and is given a score of 70. The 'New Outer Breakwater' option will provide a significant opportunity to safeguard the Harbour, and therefore scores 90. The 'Do Maximum' clearly ensures the ultimate future safeguarding of the Harbour and therefore affords a score of 100.

### **B 3.2 Assessment of options: Cost of delivery**

Assuming that all contractually committed expenditure can be disregarded as a 'sunk cost', there will be no cost attached to the 'Do Nothing' option. The second least costly option is 'Do Minimum', we assume this is minimal and therefore affords a score of 90. Aspects of the 'Commercial Marina' option are of high capital value, and therefore this options scores 25. The 'Outer Breakwater' is a significant capital expenditure and therefore affords a score of 10. The 'Do Maximum' is the highest cost, and therefore scores 5.

### **B 3.3 Assessment of options: Supporting economic ambition**

Stonehaven is recognised as an important contributor to the North East's economic well being, and has undergone significant regeneration in recent times. The town continues to improve its destination credentials, both in a domestic and international market. Supporting economic development is an important objective of the Harbour development and this suggests that the 'Commercial Marina', 'Outer Breakwater' and 'Do Maximum' options all present an increasing level of opportunity to support the town's economic ambition.





**B 3.4 Assessment of options: Environmental Sustainability**

Like ‘Safeguarding the Harbour’, the extent to which each option promotes environmental sustainability will be directly related to the ability of each option to protect and enhance the environment. Based on these principles, the same scores as ‘Safeguarding the Harbour’ have been assumed on this criterion.

**B 3.5 Assessment of options: Deliverability and Timing**

Like ‘Cost of Delivery’, the ability to deliver within the short to medium terms is directly correlated with the cost of delivery. Based on these principles, the same scores as ‘Cost of Delivery’ have been assumed on this criterion. A funding assessment will be required of the final preferred option, and is likely to require a cocktail of funding from various sources including EU, UK and local sources of grant funding. There is scope for private finance, but this will be dependent on the final business case of the preferred option, and an assessment of the likelihood of a commercial return – either directly onsite through marina activities or any potential related offsite development.

By aggregating together all of the weighted scores, it can be shown that the ‘Do Maximum’ option presents the best value method of achieving the stated objectives.

Criteria	Do Nothing	Do Nothing	Do Minimum	Do Minimum	Commercial Marina	Commercial Marina	New Outer Breakwater	New Outer Breakwater	Do Maximum	Do Maximum
Safeguard the harbour	-25	-6.25	0	0	65	16.25	75	18.75	100	25
Cost of delivery	100	25	90	22.5	25	6.25	10	2.5	5	1.25
Supporting economic ambition	0	0	10	2	50	10	70	14	100	20
Environmental sustainability	-25	-5	0	0	65	13	75	15	100	20
Deliverability and timing	100	10	90	9	25	2.5	10	1	5	0.5
<b>Total</b>		<b>23.75</b>		<b>33.5</b>		<b>48</b>		<b>51.25</b>		<b>66.75</b>

**B 4 Summary**

This strategic economic appraisal has demonstrated a number of key findings:

- There is a strong policy fit at the local and national level, in particular the importance of growing the tourism sector and supporting sustainable economic growth ambitions
- Although an affluent region, there is a focus of broadening the economic base of the local area, including the importance of growing the local tourism market through various investments and interventions



- Stonehaven does not show signs of any significant detrimental impacts of the economic recession, however the area has lagged behind other local areas in terms of employment, house prices and is more reliant on jobs outside the local area – there is a drive to create new employment locally to stop daily out-migration
- There is a strategic drive at the national level to promote sailing and sailing tourism, and Scottish Enterprise are committed to supporting sailing activities to unlock the significant economic potential of sailing
- The net economic benefits at the regional level of growing sailing tourism are estimated by Scottish Enterprise to be around £1.5million, safeguarding around 36 jobs at the regional level.
- At the local level there is potential for a redeveloped harbor to inject up to £500k per annum to local businesses and experience from other harbour developments suggests there will be job creation opportunities
- There will be other economic impacts associated with any construction work and wider impacts, including safeguarding the harbours current business activities, promoting the attractiveness of the harbour as a tourism destination, growing other sectors as a result of investing in the harbour, potential new onshore developments and enhancing the overall attractiveness of Stonehaven as place to live, visit, invest and work.
- In completing the option appraisal assessment, it is clear that the 'Do Nothing' and 'Do Minimum' options are not viable options for Stonehaven Harbour. The Do Maximum Options scores highest due to its ability to 'Safeguard the Harbour', Support Economic Ambition' and deliver 'Environmental Sustainability. However, it does not score well on cost, timing and deliverability and therefore is likely to be progressed in a 'Phased Approach'
- A detailed economic appraisal of the preferred option(s) would have to be undertaken prior to assessing funding opportunities from both the private and public sectors – a business case of the preferred option would also have to be undertaken following ratification of the feasibility study findings

## **PART C – ENVIRONMENTAL**

### **C 1. Introduction**

#### **C 1.1 Project Understanding and Brief**

Waterman Energy, Environment & Design Limited (Waterman), in conjunction with PJ Consulting & Associates and MKA Economics, was instructed by the Stonehaven Town Partnership (STP) to undertake an Environmental Appraisal of Stonehaven Harbour and its surroundings, in order to inform a Harbour Development Feasibility Study. The purpose of the Feasibility Study was to explore the potential for a commercially viable marina development within the harbour and, pending the outcome of this study, define alternative options, where available, to ensure the long-term viability of the harbour.

This Environmental Appraisal provides supporting information to the main Feasibility Study Report, produced by PJ Consulting and MKA.

This report has been prepared for the exclusive use of STP for the purpose of assisting them in evaluating the potential environmental constraints attached to the site.

The objective of this report is to identify potential significant environmental issues associated with redevelopment of the harbour, or other options as deemed appropriate, and to highlight what, if any, additional works may be required to further substantiate potential issues and support the planning or development process. This report aims to identify potential environmental risks associated to:

- Landscape and Visual Amenity;
- Ecology (Terrestrial and Marine);
- Archaeology and Built Heritage;
- Ground Conditions and Contamination;
- Water Environment (including Water Quality and Flooding);
- Noise and Vibration;
- Air Quality; and
- Transport and Access.

All of the above issues have the potential to pose significant constraints to redevelopment or maintenance and repair operations, with resultant potential project **delays and/or significant costs**. Thus the aim of this report is not to provide a definitive answer with regards to the above issues, but to provide early warning to STP of potential constraints and risks at the site, in order that they can be accommodated within the planning and delivery of any future works to the harbour.

The information presented within this report is based on information provided within a Ground Sure EnviroInsight dataset, from viewing historical information pertaining to the site and from a variety of available online information sources. Where the Client has supplied additional information, it has been assumed that the information is correct. Waterman has endeavored to assess all third party information provided to them during the preparation of this report, but makes no guarantees or warranties as to the accuracy or completeness of this information.

The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at, or adjacent to, the site.

## C 1.2 Limitations

No detailed technical site surveys have been undertaken in preparing this report, though a general site walkover was conducted by Regional Director Ben Steele on 27 January 2015 and an initial assessment of current operating practices at the site was undertaken, based on visual evidence of such activity only.

This report does not include a site investigation, nor does it include any consultation with local regulatory authorities. On this basis, we cannot guarantee that all land uses or issues of concern have been identified in this report. Waterman will not accept responsibility for inaccurate data provided by third party data providers.

This report does not include an assessment for the presence of asbestos containing materials within or below buildings or in the ground at the site. Should there be a requirement under the Control of Asbestos Regulations 2006 for any part of the site to be deemed 'non-domestic premises' (including, inter alia, outbuildings, external pipework, under-floor service ducts, bridges, fixed and mobile plant), the duty holder(s) should prepare an asbestos risk management plan and this may require technical survey works as described in the relevant HSE Guidance Note MDHS 264.

An assessment of current operating practices and/or site conditions has not been completed as part of the desk based review. Furthermore, an audit of environmental documentation including licenses, consent documentation and/or waste management has not been undertaken and there may therefore be instances where current occupiers are carrying out unauthorised operations and/or operating in breach of their environmental permits. An inspection and audit would be required to establish site operational practices in this regard.

The Scottish Environment Protection Agency (SEPA) and Local Authorities were not directly contacted for this report, and it should be noted that the information relied upon from the regulatory and non-regulatory data searches (contained within the Ground Sure database) is reviewed annually as a minimum. Additional processes or controls may therefore have been implemented subsequent to the last information review and as such, Waterman will not accept responsibility for inaccurate data provided by others.

## **C 2. Site Context**

### **C 2.1 Current Uses**

The site is currently in use as a commercial harbour and is located at Stonehaven Harbour, Old Pier, Stonehaven, Kincardineshire AB39 2JU and approximately centered on National Grid

Reference 387870, 785417. Stonehaven is the largest of the recreational harbours in Aberdeenshire and has three basins extending to 18,200 square meters and 550 meters of berthing space on the quays.

As an active harbour, the site has been developed with a pier and jetties, with moorings and access facilities. Both inner and outer basins dry out at low water but the cofferdam basin, an open area protected by the breakwater, has a depth of 1m at Mean Low Water Spring (MLWS). The north pier area is used for parking, fishing and the Stonehaven Harbour Office and Maritime Rescue Institute are located on the Old pier. The harbour structure itself does not have any vegetation cover and is generally composed of reinforced concrete.

The site is generally flat, at 5m above ordnance datum (AOD) on constructed piers, dating from approximately 1825. A slipway leading from the High Street leads to a beach, providing access to the waterfront. The buildings along Shorehead to the immediate west of the harbour are presumed to date from the 16th century onwards and comprise a mix of residential and commercial uses.

There are no landfills, environmental permits or licenses recorded at the site. A crane, fish jetty, slipway, pumping house and inner dock are currently identified on site. Services available also include water and power points on the quays, and a 1.5-ton crane on the fish jetty.

### **C 2.2 Historical Uses**

The harbour at Stonehaven dates from approximately 1607 and has been rebuilt several times after storm damage. The Harbour in its current layout was constructed in 1825 to provide three basins, comprising 18,200m<sup>2</sup> and 550m of berthing space at the quays. A Fish Market was historically present at the harbour, associated with the previous operation of a herring fishing fleet, though the harbour is now primarily used for recreational purposes, with the exception of small scale local fishing (mainly crab and lobster potting).

### **C 2.3 Access**

The site is currently accessed by vehicles via the High Street and Shorehead, with a network of surrounding roads, residential streets and footways also providing pedestrian access to the harbour. The A92 lies 1km to the south of the site, with the junction to the A90; a primary road connecting Fraserburgh and Edinburgh, lying 1km to the southwest.

Footpaths are located throughout the area, including the Aberdeenshire Coastal Path, part of the North Sea Trail, utilising roads to the west of the site and unmarked roads immediately to the south of the site. There are also a number of Core Paths in the area. The North Sea Cycle Route,

Sustrans NCN Coast and Castles North and National Cycle Route are also located in the wider surrounding area.

Stonehaven railway station is located 1.5km to the north west of the site, providing access to services serving Aberdeen, Edinburgh, Glasgow and onwards to Bristol, Birmingham and London.

The harbour itself contains almost 140 regular moorings, with a priority given to local fishing and recreational boats and provision for over 50 berths within the inner basin.

### **C 2.4 Planning Context**

The current Local Development Plan for Stonehaven does not identify the harbour for any allocation and the town of Stonehaven is identified as a Coastal Zone, with approximately 0.10ha allocated in Stonehaven for new business land. A review of available planning records indicates the following applications relating to the site:

- Alterations and Upgrading to Breakwater Steps Including Replacement Handrails, The Breakwater Stonehaven Harbour Shorehead Stonehaven AB39 2JU (Ref. No: APP/2013/2492) Status: External Decision (referral to Scottish Ministers for determination) - Granted
- Installation of Replacement Stairs (at Breakwater), Installation of Five Replacement Davits (at Old Pier and Breakwater) and Repainting of Safety Railings (in yellow), South Pier, Fish Jetty, Old Pier and Breakwater Stonehaven Harbour Stonehaven AB39 2JU (Ref. No: APP/2012/3293) in 2012. Status: Application Withdrawn

### **C 2.5 The Surrounding Area**

#### **C 2.5.1 Current Use**

The harbour is located to the south of the town of Stonehaven. The North Sea lies to the north and east, residential housing lies to the west and north, and agricultural land is located to the south and west of the site on higher ground. Residential properties and several restaurants, public houses and hotels lie along Shorehead Road to the west of the harbour. The Tolbooth Museum is located on High Street at the north of the harbour, alongside the Stonehaven Harbour Office.

Kincardine Community Hospital is located 2km north west of the site. Dunnottar Primary School is located approximately 250m northwest of the site, and a number of primary schools and pre-school nurseries are located throughout the wider area. Stonehaven Caravan Park is located 1.5km north of the site.

A pipeline is recorded 50m northeast of the site, though the nature of the pipeline is currently unknown. Other industrial uses within the surrounding area include a gas governor station 80m west of the site, an electricity substation located 130m west of the site, and several garages in the town of Stonehaven to the north west of the site. A petrol station is recorded 470m northwest of the site.

There are no landfills or environmental permits recorded within 500m of the site.

### **C 2.5.2 Historical Use**

Earliest historical mapping dating from 1867 showed a quarry 150m south east of the site. By 1903, a gas works was located 80m west of the site on Cowgate and the quarry to the south east of the site had extended westerly along the coast at Red Craig, to within approximately 100m of the site. Maps dating from 1927 showed a tannery 250m to the north west of the site and by 1955 a works was shown at this location.

Mapping dating from 1966 showed the gas works as disused, and also depicted a disused sawmill 120m northwest of the site beyond the gas works. The quarry to the south east of the site had been in-filled by this time. Map editions dating from 1969 showed the tannery or works as no longer present, and a pipeline was depicted to the north of the harbour. A spoil heap was depicted 450m southwest of the site at Spaldings Hill in 1973, which was shown as disused workings on subsequent map editions. By 1976 the tanks and chimneys associated with the gas works had been removed, although the gasholder remained. A caravan park was also shown to the north of the harbour at this time.

By 1989 a pump house was shown to the north of the Old Tolbooth road within the harbour area, the disused saw mill had been redeveloped as housing, and an electrical substation was shown 110m to the northwest. Maps dating from 1992 showed a depot 240m north east of the site. No further significant changes were noted on subsequent mapping editions up to present day (2015).

### **C 3. Environmental Appraisal**

The following sections set out the findings of desk-based research conducted on each of the technical topics covered by this report, namely:

- Landscape and Visual Amenity;
- Ecology (both Terrestrial and Marine);



- Archaeology and Built Heritage;
- Ground Conditions and Contamination;
- Water Environment (including Water Quality and Flooding);
- Noise and Vibration;
- Air Quality; and
- Transport and Access.

## **C 4. Landscape and Visual Amenity**

### **C 4.1 Methodology**

The following on-line sources have been consulted for information relating to landscape designations:

- Scottish Natural Heritage: [www.snh.gov.uk](http://www.snh.gov.uk)
- Aberdeenshire Council: [www.aberdeenshire.gov.uk](http://www.aberdeenshire.gov.uk)

### **C 4.2 Baseline**

The site comprises a harbour within a coastal town, with the wider surrounding area typically rural in nature. From a review of available information, it appears that the site is not located within any nationally or locally designated landscape area.

The regional Landscape Character Type encompassing Stonehaven is classified by SNH as Coast: Coastal Strip and described as mainland rocky coastline with open sea views, productive arable farming occurring up to the cliff edge, minimal tree cover and compact fishing villages located at the base of cliffs in small bays. While there are exposed and open seascapes to one side, to the other the coast gives way to an agricultural hinterland, the presence of settlements and nearby roads. The coastal area, although important to the character of Aberdeenshire, covers little of its surface area; just 4%, being a predominantly narrow strip.

The landscape character area of the site and surrounding area is classified by SNH as Kincardine Cliffs (20). This classification describes 30km of coastline between Aberdeen and Inverbervie, with key characteristics including steep cliffs, stacks and arches, and raised beach platforms; farmland extending to cliff edge; fishing settlements; and expansive or exposed views.

Pressures upon this landscape character type include from built developments, which can be highly visible and impact on setting of coastal cliffs, stacks and arches. The open and exposed character of the landscape is also sensitive to changes in land use and scale of development. Development within small stone harbours is also identified as a factor, which may lead to loss of their intimate character.

The following Valued Views were identified in the Aberdeenshire Local Development Plan (2012) Supplementary Guidance (SG) Landscape 2: Valued Views:

- the view of the Black Hill from Stonehaven Golf Course;
- the view from the Slug Road, Stonehaven to Kerloch.

Initial review suggests that the site is not located within, or is not a significantly visible feature within, either view.

### **C 4.3 Recommendations**

A Landscape and Visual Appraisal, including seascape, is likely to be required to inform design and support planning for any redevelopment works. Such appraisals aim to evaluate the potential impacts of development proposal on existing landscape character and 'key views' and typically include:

- A Geographic Information System (GIS) terrain model generated from Ordnance Survey data to produce a Zone of Theoretical Visibility (ZTV) of the site;
- Field survey to verify desk based work and establish the 'visual envelope', existing landscape character and identify key views to establish site visibility;
- Feedback of information into the design process, identifying opportunities and constraints to development; and
- Assessment of impact on the existing landscape and visual context of the proposed development. Where adverse impacts are identified, mitigation measures are typically recommended in order to reduce any impacts as far as practicable.

## **C 5. Ecology**

### **C 5.1 Methodology**



The following information has been obtained from a review of available information sources including:

- Scottish Natural Heritage Sitelink (Scotland): <http://gateway.snh.gov.uk/sitelink/>
- Royal Society for the Protection of Birds (RSPB) website: [www.rspb.org.uk](http://www.rspb.org.uk)
- Multi-Agency Geographic Information for the Countryside (MAGIC): [www.magic.gov.uk](http://www.magic.gov.uk)
- Aberdeenshire Council: [www.aberdeenshire.gov.uk](http://www.aberdeenshire.gov.uk)

**C 5.2 Baseline**

MAGIC and SNH Sitelink websites were interrogated to identify protected sites (including Natura 2000 sites; Special Protection Area (SPA), Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI)) within 5 km of the site. No designated sites are located within the site but the following are located within 5km:

Site Name	Designation	Distance from Site (km)	Description/Citation
Garron Point	SSSI and SAC	860m north	Garron Point is a rock coastal promontory with cliffs and coastal grassland, located immediately north of Stonehaven. Notified features of ecological interest include butterfly (Northern brown Argus <i>Aricia Artaxerxes</i> ) and the invertebrate the Narrow-mouthed whorl snail <i>Vertigo angustior</i> .
Fowlsheugh	SPA	1.8km south	Fowlsheugh SPA is designated for its seabird assemblage (at least 20,000 individuals) and breeding populations of kittiwake <i>Rissa tridactyla</i> , razorbill <i>Alca torda</i> , fulmar <i>Fulmar glacialis</i> , guillemot <i>Cepphus grille</i> and herring gull <i>Larus argentatus</i> .
Loch of Lumgair	SSSI	3.6km south west	The site is one of the best examples of basin mire remaining in Scotland's north eastern lowlands with fen, birch-sallow carr, swamp and floating 'schwingmoor' vegetation.
Fowlsheugh	SSSI	3.8km south	Fowlsheugh has the largest colony of breeding sea birds in the north east of Scotland and one of the largest colonies in Britain. The principal species; kittiwake, guillemot and razorbill are present in nationally or internationally important numbers. The assemblage of breeding seabirds, more than 100,000 individuals, also includes small numbers of puffin <i>Fratercula arctica</i> and shag <i>Phalacrocorax aristotelis</i> , as well as herring, lesser and great black back gulls.



In addition to the above, the following features of potential ecological value have been identified on, or within the immediate vicinity of, the site:

- the local marine environment (present within the site and located immediately to the east, north-east and south-east) supports many species of seabird;
- there is a gull colony at Stonehaven Bay. Gulls are present throughout the year including black-headed *Chroicocephalus ridibundus*, common *Larus canus*, herring, great black-backed *Larus marinus* and lesser black-backed *Larus fuscus*.
- Species present in the wider area include kittiwake, fulmar, manx shearwater *Puffinus puffinus*, great skua *Stercorarius skua*, pomarine skua *Stercorarius pomarinus*, arctic skua *Stercorarius parasiticus*, red-throated diver *Gavia stellata*, Black throated diver *Gavia arctica* and great northern diver *Gavia immer*. All three species of diver are listed on Annex 1 of the EU Birds Directive. This coast is also regarded as being of particular importance for sea-ducks and grebes, which generally occur inshore and over-winter in sandy bays.
- Auks, divers and sea duck are regularly recorded at Stonehaven, with previous species records including Slavonian grebe *Podiceps auritus* and Grey Phalarope *Phalaropus fulicarius*.

The inter-tidal and sub-tidal habitat present within the marine environment as above also has the potential to support a diversity of benthic invertebrates, as summarised below.

- Studies associated with the proposed European Offshore Wind Deployment Centre at Aberdeen recorded a largely homogeneous seabed of medium-fine well-sorted sands in shore areas, whereas sediments further offshore and at deeper sites are dominated by fine-very fine muddy sands. Associated sediment invertebrate communities included the catworm *Nephtys cirrosa* and amphipods over inshore areas with a comparatively richer and more diverse community characterised by the polychaete worms *Notomastus latericeus*, the bivalves *Nucula nitidosa* and *Tellina fabula*, and brittlestars *Ophiura* spp. Larger, more mobile species present include brown shrimp *Crangon crangon* and swimming crab *Liocarcinus holsatus*.
- Associated benthic fish species include common dab *Limanda*, plaice *Pleuronectes platessa*, whiting *Merlangius merlangus* and pogue *Agonus cataphractus*. Commercially important fish species such as whiting, Atlantic cod *Gadus morhua* and Norway pout *Trisopterus esmarki* were recorded in deeper water areas.

The freshwater (River Carron, approximately 1km north of the site) and marine (North Sea) environments hold the potential to support diadromous species (those that live between fresh and

marine water) as well as pelagic (live in water column) and demersal (live on or near the sea-bed) marine species, as summarised below.

- Pelagic species within the North Sea include herring *Clupea harengus*, sprat *Sprattus sprattus* and mackerel *Scromber scrombus*.
- Characteristic demersal species of this part of the North Sea include Atlantic cod, haddock *Melanogrammus aeglefinus*, Norway pout, monkfish *Lophius piscatorius*, herring, saithe *Pollachius virens*, plaice, lemon sole *Microstomus kitt*, grey gurnard *Eutrigla gurnardus*, common dab and American plaice *Hippoglossoides platessoides*.
- Diadromous species move between freshwater and the marine environment during their lifecycle. These can be split between anadromous (species that hatch in freshwater, leaving for sea and returning to their natal river to breed) and catadromous, (species that hatch in the marine environment, moving into the freshwater environment to feed and grow, returning to the sea to breed). Anadromous species include the Atlantic salmon *Salmo salar*, sea trout *Salmo trutta*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*. Catadromous species include the European eel *Anguilla*. There are major rivers along the east coast that are home to such species, this includes the North Esk, South Esk, Ythan, Don, Dee, Tay, and Spey. Atlantic salmon, river lamprey and sea lamprey, twaite shad and allis shad are listed as protected species in Annex II of the EU Habitats Directive.
- Basking shark *Cetorhinus maximus* occurs infrequently in this part of the North Sea in comparison to areas off the west coast of Scotland.
- Typical shellfish species within the North Sea include Norway lobster *Nephrops norvegicus*, cockle *Cerastoderma edule*, scallop *Pecten maximus*, whelk *Buccinum undatum* and pink shrimp *Pandalus borealis*. These species are usually associated with mud, sandy mud and coarser mixed sand and gravel sediments. The European lobster *Hommarus gammarus*, velvet swimming crab *Necora puber*, blue mussel *Mytilus edulis*, Periwinkle *Littorina littorea* and shore crab *Carcinus maenus* also occur commonly and are normally found in shallow rocky and boulder habitats. Edible crab *Cancer pagurus* also inhabit inshore rocky areas although females undergo extensive annual spawning migrations utilising clean sand and gravel substrates for over-wintering.
- the wider region comprises spawning ground for herring *Clupea harengus*, Atlantic cod, whiting, sand eels (*Ammodytidae*), *Nephrops* and plaice *Pleuronectes platessa*.
- Shallow sediment embankments along east coast of Scotland offer suitable nursery habitat for Atlantic cod, whiting and plaice. Studies in Stonehaven Bay have recorded young

Atlantic cod, haddock and whiting appearing from late April to around mid-May, then settle to the seabed during July and August where they feed and grow. Following settlement, these species move off to live in the pelagic zone of deeper waters as they grow.

### **C 5.3 Recommendations**

On consideration of the above findings and given the nature and location of the site and proposed redevelopment works, it is considered likely that the following further work may be required to inform design and support planning for any future redevelopment works at the site.

#### **Extended Phase 1 Habitat Survey**

An Extended Phase 1 Habitat Survey would include the following:

- Site survey carried out following the JNCC Phase 1 Habitat Survey Handbook, which aims to map and broadly describe habitats on the site. In addition, any actual or potential for legally protected and/or notable species would be noted; and
- Recommendations for any further, more detailed ecology survey work, if required.

The requirement for, and extent of, additional ecology surveys would be defined by the Extended Phase 1 Habitat Survey. It should be noted that many surveys are seasonally constrained and can only be carried out during particular times of the year. This can result in delays to project timescales and therefore early completion of an Extended Phase 1 Habitat Survey is strongly recommended, in order that timings for further survey can be accurately predicted.

#### **Bird Survey**

Site specific survey, including Vantage Point surveys, may be required to characterise the seasonal use by, and value of the Site to birds. This may include census surveys of birds listed as qualifying features of the identified SPAs that may therefore have connectivity with the site. Field survey techniques may require statutory agreement prior to mobilisation.

Typical potential effects of port and harbour construction may include temporary noise, vibration, light and visual disturbances causing displacement from preferred roosting, nesting or feeding habitats. Similar potential effects could arise during the operational phase of the development given increased activity and traffic within the Site. Other effects may relate to leakages or spillages from construction activities leading to water pollution. Permanent habitat loss may occur due to the placement of infrastructure resulting in the loss of suitable habitat. Any Likely

Significant Effects (LSE) on birds, which are qualifying features of SPAs, will require an Appropriate Assessment to be undertaken under Article 6 of the Habitats Directive (92/43/EEC).

### **Benthic Invertebrates**

Further desk study and/or site-specific survey may be required to characterise the distribution and sensitivity of benthic habitats and species within the vicinity of the site and any proposals. This would include the presence of protected faunal and floral features.

Typical potential effects of port and harbour construction could include temporary noise and vibration, which could lead to a reduction, in diversity and abundance of benthic invertebrates within the footprint of the proposed development. Other effects of the work are likely to include temporary loss of habitat. An increase in suspended sediment resulting from construction may lead to temporary scouring effects on sensitive fauna within the influence of sediment plumes (suspended sediment carried by tides and currents), and sediment settlement from the plume has the potential to temporarily smother fauna and flora on the seabed surface (possibly out-with the footprint of the proposed development). The permanent placement of infrastructure on the seafloor will lead to permanent reduction in seabed habitat whilst the infrastructure itself may represent new habitat for attaching and encrusting species.

### **Fish**

Further consultation with the local District Salmon Fisheries Board would permit potential impacts of any proposed works on migratory salmonids and lamprey to be discussed. Noise and vibration associated with any proposed development may cause physiological changes in the species and disrupt migratory patterns.

Consultation with Marine Scotland would permit feedback of a key stakeholder on the potential impacts associated with any proposed development. Works may also result in the temporary loss of spawning grounds, result in disturbance to the sea-bed (increase in sediment suspension and deposition) and an increase in chemical pollution from the remobilisation of contaminants from within the seabed / release of contaminants from vessels leading to a reduction in water quality.

## **C 6. Archaeology and Built Heritage**

### **C 6.1 Methodology**

The following on-line sources have been consulted for information relating to archaeology and heritage features:

- Pastmap (Scotland): [www.pastmap.org.uk](http://www.pastmap.org.uk)
- Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS): [www.rcahms.gov.uk](http://www.rcahms.gov.uk)
- Aberdeenshire Council: [www.aberdeenshire.gov.uk](http://www.aberdeenshire.gov.uk)
- Historic Scotland [www.historic-scotland.gov.uk](http://www.historic-scotland.gov.uk)

### **C 6.2 Baseline**

There are no Scheduled Monuments on site.

The site is listed as a Category B Listed Building (Stonehaven Harbour). The designation was listed on 18/08/1972 and relates to the harbour dating from the 16th century and later, extended 1825-35, Robert Stevenson, and later, repaired 1970s. The Harbour comprises middle, inner and outer basins, and 4 piers (Net Pier or Old Pier, Fish Jetty, both before 1823, South Pier, and Breakwater after 1867). Net Pier has vertically coursed masonry, South Pier with masonry in inclined courses. High coped rubble parapets, noted at South Pier, which together with Fish Jetty, form the inner basin. The designation further identifies that Stonehaven Harbour, situated in a natural bay between the River Carron and Downie Point, has long been the focal point of the town. Its special interest derives from the fine stonework, structure and plan as well as the historical significance of its role in the development of Stonehaven from small fishing port to flourishing burgh. The original north pier, built in the 16th century, was twice destroyed and subsequently rebuilt in 1688 by the 9th Earl Marischal. A second pier, built in 1700, formed the north harbour. Although hugely important for the import and export of goods to and from Stonehaven during the 18th century, the harbour is now (early 21st century) predominantly used for recreation.

Other listed buildings recorded within the site include:

- Old Pier, dating from the late 16th century, including boundary wall;
- Old Booth Sundial, a free standing sundial dating from 1710; and
- Shorehead Duthie's wall, a square ashlar structure enclosing a well, dating from the early 19th century.



The following Canmore (RCAHMS search tool) records are also identified on site:

- Stonehaven Harbour; breakwater pilot beacon;
- Stonehaven Harbour; the breakwater;
- Rival Stonehaven harbour entrance;
- South pier;
- Jubilee Stonehaven harbour entrance; and
- Lifeboat station.

The site is also located within the Stonehaven Conservation Area, which was designated by Aberdeenshire Council in 1997 and incorporates a significant proportion of the town, including the entire harbour area.

There are a further 185 records of Listed Buildings situated within 1km of the site, including several properties adjacent to the harbour along Shorehead and Old Pier roads.

### **C 6.3 Recommendations**

On the basis of the above findings, it is recommended that a Heritage Statement be undertaken to inform any future planning application for redevelopment works at the harbour. Heritage Statements are produced to meet relevant archaeological and historic built environment policy requirements and assess the significance of heritage assets. They typically include:

- Search of relevant databases and review of known heritage assets on the site and within the surrounding area;
- Review of previous heritage investigations, if available;
- A site and area walk-over survey;
- Review of heritage related planning policies;
- Appraisal of the likelihood for the presence of currently unknown heritage assets within, and immediately close to, the site;
- Assessment of whether heritage investigations (e.g. archaeological trial trenching) are needed to inform the planning process; and

- Liaison with local authority on heritage issues, including submission of the Heritage Statement, where appropriate.

In addition, due to the listed status of the harbour, Listed Building Consent will be required, in addition to planning consent, for any redevelopment or significant alteration works to the harbour. The requirement for Listed Building Consent to support any proposed maintenance and repair works to the harbour, as required, should be determined through consultation with Aberdeenshire Council and Historic Scotland at the appropriate time.

## **C 7. Ground Conditions and Contamination**

### **C 7.1 Methodology**

In order to establish potential constraints associated with ground conditions and contamination at the site, the following records were consulted.

#### **Historical Data Set**

A set of available historical maps (1:1,250, 1:2,500, 1:10,000 and 1:10,560 scale) maps from Ground Sure has been reviewed in undertaking this assessment. In addition, historical maps (1:10,000 and 1:10,560 scale) indicating Potentially Contaminative Uses and Potentially In filled Land information have been reviewed.

#### **Database Review**

A site-specific search was commissioned from GroundSure (EnviroInsight and GeoInsight). The search provides a summary of information held on the public register by various bodies, including SEPA, Local Authorities, the British Geological Survey (BGS), the Coal Authority and the National Radiological Protection Board. The information includes details of: abstraction licenses, pollution incidents, operational and non-operational landfill sites, authorised processes, ecological designations and data relating to the risk of subsidence, landslip, radon and flooding, both on the site and within 1km of the site. The search also gives an indication of the environmental sensitivity of the site and any potentially contaminative industries or operations within the vicinity of the site.

The search was reviewed with data applicable to the study site recorded on the basis of a 1km radial search from a given center point of the site (six figure grid reference). Where no records were identified in this search radius, no entry in the database search table is recorded. Where

data is recorded, relevant details are reported in the database search table, in addition to assigning a risk level to reflect the significance of the data reported.

Data provided by SEPA is predominantly supplied with six figure grid references, and consequently has an accuracy of 100m. In the case of the registered Landfill Sites data-set, where no boundary is available, approximate positions of the sites have been supplied using a grid reference point, which can vary from the site entrance to the center of the site. At present there is no complete national data-set for landfill site boundaries. Where only a grid reference is known for a site, a 250m buffer zone is identified, to highlight the potential presence of a landfill. Registered landfill sites may appear in more than one dataset.

### **Geological and Hydrological Data Review**

A review of available BGS data sources has been undertaken to provide information on the likely geological conditions (solid and drift) beneath the site. A review of available SEPA data sources has also been undertaken to provide information relating to water quality, groundwater quality and flood risk.

## **C 7.2 Baseline**

### **Geology and Hydrogeology**

Made Ground underlies the site, as a consequence of dredging and constructing the harbour. Superficial deposits of Marine Beach Deposits and Raised Beach Deposits of Flandrian Age are also recorded on site. Superficial drift deposits and artificial ground below the site can be expected to be highly permeable. Bedrock deposits comprising Carron Sandstone Formation further underlie the site. Bedrock deposits are expected to be moderately permeable.

Faults are recorded in the wider area, including 50m south, 150m east and 385m southwest.

### **Radon**

The site is not located in a Radon Affected Area as defined by the Health Protection Agency (HPA) as less than 1% of properties are above the Action Level. Consequently, radon protective measures are not required for new properties or extensions to existing buildings. A 2010 update to the guidance issued by the Health Protection Agency has reduced the threshold within which properties are considered at risk. As such, the Building Control Department at the Local Authority should be consulted in the event of future building works or extensions.

### **Ground Works and Mining Instability**

Historical surface ground workings have been identified on site and relate to the development of the docks in 1978 in the southern basin of the harbour.

A quarry was historically located 100m south east of the site. According to the data set, Red Craig Quarries, a sandstone quarry 160m southeast of the site is no longer operational.

The site is not located within an area at risk from coal mining activity. The dataset indicates that localised small-scale mining may have occurred on site and in the surrounding area. This is considered likely to relate to the development of the harbour.

According to the dataset, ground conditions are predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays. Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides. Soluble rocks are present, but unlikely to cause problems except under exceptional conditions.

### **Pollution Incidents**

There are no records of pollution incidents associated with the site or the surrounding area.

## **C 7.3 Recommendations**

### **Contaminated Land**

No potentially significant risks in relation to contamination have been identified on site from the desk based review. Based on Waterman's experience it is anticipated that such risks should be confirmed by a Preliminary Environmental Risk Assessment (PERA) including walkover survey of the site to identify potentially contaminative activities, together with any sensitive receptors; consultation with relevant Local Authority Departments; and production of a preliminary conceptual model to determine the potential existence of pollutant linkages at the site and its associated risk of being classified as contaminated land under Part IIA of the Environmental Protection Act 1990.

Additional consideration of the potential for any future redevelopment or maintenance/repair works to result in contamination of soils and waterbodies should also be given, though such issues are often readily addressed and mitigated through standard construction management, for

example the implementation of Construction Environmental Management Plans and best practice working procedures.

### **Asbestos**

It is recommended that specialist advice be sought regarding the presence, or likely presence, of ACMs including review of any available Asbestos Surveys, Asbestos Registers or Management Plans, prior to demolition or alteration works to the harbour or associated buildings and structures as part of any redevelopment or maintenance and repair works.

### **Radon Advice**

The Local Authority (Building Control) should be consulted regarding radon risk and the potential requirement for radon protection measures within any proposed new buildings associated with redevelopment.

## **C 8. Water Environment**

### **C 8.1 Methodology**

#### **Database Review**

A site-specific search was undertaken using online resources from SEPA that includes details of: abstraction licenses, pollution incidents, and data relating to the risk of subsidence, landslip, and flooding, both on the site and within 250m of the site. The search also gives an indication of the environmental sensitivity of the site.

Data provided by SEPA is predominantly supplied with six figure grid references, and consequently has an accuracy of 100m. Flood risk data provided by SEPA is only indicative and accurate as of the date of generation of the report. This data also relates exclusively to fluvial and tidal flooding and does not include pluvial or groundwater flooding.

#### **Strategic Flood Risk Assessments**

In England, Scotland and Wales, Strategic Flood Risk Assessments (SFRAs) are a required part of the local planning process. They are primarily produced by local planning authorities, in consultation with the EA or SEPA, and are intended to "form the basis for preparing appropriate

policies for flood risk management" at the local level. Each local authority or group of local authorities has an SFRA, which has been reviewed as part of this assessment.

## **C 8.2 Baseline**

### **Surface Water Features and Water Quality**

The site is located within Stonehaven Bay, part of the North Sea. This area of the North Sea is classified by SEPA as Garron Point to Downie Point (Stonehaven), extending to an area of 16.62km<sup>2</sup>. SEPA have classified this water body as having an overall status of Good with High confidence in 2008 with overall ecological status of Good and overall chemical status of Pass. SEPA also note that Garron Point is a Special Area of Conservation (SAC).

The mouth of the Carron Water lies 100m to the north of the site. SEPA classified this water body as having an overall status of Moderate with Medium confidence in 2008 with overall ecological status of Moderate and overall chemical status of Pass. Pressures on this waterbody are from diffuse source pollution as a result of mixed farming.

The mouth of the Cowie Water lies 500m north of the site where it flows to the North Sea. SEPA classified this water body as having an overall status of Good with Medium confidence in 2008 with overall ecological status of Good and overall chemical status of Pass. SEPA have not identified any pressures on this waterbody.

Stonehaven Bay, from Garron Point to Downie Point to the north is a protected bathing water area under EC Bathing Water Directive 2006. The designated bathing water at Stonehaven encompasses approximately 1 km stretch of the bay; the designated area is bound by the outflow of the River Carron and the harbour jetty to the south. During the bathing season, the waters are monitored by SEPA. Risks to water quality in this area are identified as surface water urban drainage, agricultural run-off and combined sewer overflows and result in elevated bacteria levels compared to dry weather conditions. Other sources include the gull colony concentrated at the mouth of the River. SEPA assessment indicates that potential sources of short-term faecal indicator pollution can at time originate from both animal and human sources; bathing is not advisable during or following rainfall. Overall data from SEPA suggests that the condition of this water body is poor.

Sediment material within the bay is predominantly sand with a small proportion of silt. Apart from local surface water discharge, no other material enters the basins or channels to contaminate the sediments. The best practicable environmental option (BPEO) assessment previously undertaken for dredging works in the harbour confirmed that the material to be disposed is predominantly

sand dredged from areas of high wave energy and from areas with no known sources of appreciable pollution.

### **Groundwater**

The groundwater body underlying the site is classified as the Stonehaven bedrock and localised sand and gravel aquifers, extending to an area of 196.81km<sup>2</sup>. The site is located within a groundwater Drinking Water Protection Zone although no potable water extraction records at the site have been identified.

### **Exploitation of Controlled Waters**

Consultation has been undertaken with SEPA to identify any discharge consents, abstractions and pollution incidents on site or within the surrounding area, though a response is currently pending. The quality of the groundwater has been classified as Poor with High confidence and the quantity of groundwater has been classified as Good with High confidence in 2008. Pressures identified upon this waterbody derive from diffuse source pollution sources, arable farming and non-urban land management measures.

### **Flood Risk**

The site is located within an area identified as being at potential risk from flooding by SEPA, and is classified as low risk of surface water flooding and high risk of coastal flooding. In addition, the Aberdeenshire SFRA identifies Stonehaven as a Potentially Vulnerable Area where the proportion of flood risk sources is categorised as: Coastal (42%), River (36%) and Surface Water (22%).

### **Drainage**

Surface water at the site is likely to drain to the North Sea to the east. No foul drainage plans have been reviewed as part of this assessment and a response from SEPA on recorded discharge consents is currently pending.

### **C 8.3 Recommendations**

Further to the above findings, it is recommended that a Flood Risk Assessment (FRA) be undertaken to inform the design and planning processes for any future redevelopment of the harbour. This would initially comprise a scoping process to appraise flood risk at a site from desk-based sources (e.g. further SEPA consultation, existing reports, topo survey etc.) and to agree the scope of any subsequent FRA with the Local Authority. Findings from scoping are then fed back

into the design process to inform scheme layout, with the final design then subject to flood modeling and reporting within the FRA.

## **C 9. Transport**

### **C 9.1 Methodology**

The Aberdeenshire Council website (<http://www.aberdeenshire.gov.uk>) has been consulted, as well as a review of available mapping, in order to inform the below appraisal.

### **C 9.2 Baseline**

#### **Accessibility**

Shorehead, an unclassified road accessed from the High Street, binds the site to the north. The local road network connects to the wider road network via the High Street and the A957. The main junctions with the A90 and A92 are located approximately 2km south west of the site. The major roads passing through the Aberdeenshire Council area comprise:

- the A90 trunk road linking Aberdeen to Dundee, Central and Southern Scotland; and
- the A96 trunk road which links Aberdeen to Elgin and Inverness.

There are several harbours and ports located along the Aberdeenshire coast used by fishing boats, oil and gas support vessels and leisure craft. The two largest are Peterhead and Fraserburgh. The frequency of marine vessels connecting the site to other harbours is unclear but suspected to be very low, given the predominant local fishing and recreation uses at Stonehaven Harbour, it is expected to be very low.

The closest train station is Stonehaven Railway Station, approximately 1.5km northwest, which links the site to Aberdeen (and Inverness) to the north and southwards to Dundee and the rest of southern Scotland.

Footpaths are located throughout the area, including the Aberdeenshire Coastal Path, part of the North Sea Trail, utilising roads to the west of the site and unmarked roads immediately to the south of the site. There are also a number of Core Paths in the area. The North Sea Cycle Route, Sustrans NCN Coast and Castles North, and National Cycle Route are also located in the wider surrounding area.



## **Parking**

Vehicle parking is currently provided on the piers, in car parks on the harbour and in/near the town center, as well as limited on street parking on surrounding roads.

## **Network Capacities**

There are no known road improvement schemes that would significantly affect proposed redevelopment of the harbour, although it is known that the immediate and wider road network is busy at peak times.

### **C 9.3 Recommendations**

Whilst achieving an appropriate marine access strategy for any proposed redevelopment of the harbour is a key requirement, consideration will also need to extend to other modes of travel, i.e. private car, walking, cycling, and public transport, in line with local and national transport policy requirements and include an assessment of how the site will integrate with the surrounding transport network. Further stages of Transport Assessment work may include one or more of the following:

- Transport Scoping (detailed review of existing data and consultation with Local Authority to agree scope of assessment, feedback into design process on constraints/opportunities);
- Transport Assessment of traffic impacts, public transport, walking/cycling, safety and servicing; and;
- Green Travel Plan (proposals to encourage sustainable travel).

## **C 10. Noise and Vibration**

### **C 10.1 Methodology**

The appraisal of potential noise and vibration impacts comprised a review of available mapping, information available on the Local Authority website and identification of potential noise and vibration sources and associated sensitive receptors, based on experience of other projects.

### **C 10.2 Baseline**

Existing potential noise and vibration sources on the site and in the surrounding area comprise:

- Harbour operations relating to the fishing and tourism industry and operation of the lifeboat;
- Waves and associated noise/vibration, including from movement of vessels and the harbour structure; and
- Road traffic noise from the local road networks, including possible vibration from HGV movements.

A number of existing sensitive receptors to noise and vibration have been identified on site and in the surrounding area, including:

- Residential properties (and hence residents) in the immediate surrounding area (i.e. Shorehead and High Street);
- Commercial properties in the immediate surrounding area;
- Users of the harbour and beach, including tourists and visitors;
- Listed Buildings and structures, including the harbour itself, which may be damaged by excessive vibration;
- Schools, primary schools and preschools, the closest of which is located 250m north west of the site.

### **C 10.3 Recommendations**

Any proposed redevelopment would likely generate increased temporary noise and/or vibration relating to the construction process, including HGV and plant movement, construction techniques (e.g. blasting, dredging, piling). Following completion of any redevelopment, any increase in harbour operations would also likely generate increased noise (e.g. from increased road and vessel traffic, increased visitor numbers).

Local authorities must review all development and associated works with the potential to be influenced by, or impact upon, existing noise and vibration conditions. Whilst the exact scope of required work would need to be agreed with the Local Authority, if required, may include:

- Consultation with local authority Environmental Health Officers;
- Background noise and vibration monitoring (daytime and night-time);

- Noise contour mapping of the site to demonstrate existing noise levels (useful in the siting of noise sensitive elements of a scheme); and
- Assessment of potential noise and vibration impacts from proposed development (e.g. traffic, plant and operational noise) in accordance with relevant guidance.

Where required, mitigation measures would be identified in line with relevant guidance to ensure that noise and vibration impacts are minimised. Such measures can include the implementation of a CEMP during any construction or maintenance/repair works and specification of limits for noise and vibration levels that are enforced through monitoring.

## **C 11. Air Quality**

### **C 11.1 Methodology**

The following on-line sources have been consulted in relation to air quality:

- Department for Environment, Food and Rural Affairs (defra): [www.uk-air.defra.gov.uk](http://www.uk-air.defra.gov.uk)
- Aberdeenshire Council: [www.aberdeenshire.gov.uk](http://www.aberdeenshire.gov.uk)

### **C 11.2 Baseline**

The site is not located within an Air Quality Management Area (AQMA).

Aberdeenshire Council has undertaken regular reviews of air quality since the introduction of the Local Air Quality Monitoring (LAQM) process. As part of ongoing LAQM, Aberdeenshire Council undertakes monitoring of NO<sub>2</sub> concentrations at several sites within their administrative area. In 2013 motoring was undertaken at 8 sites, situated within 4 settlements. In 2013 it was predicted that concentrations of NO<sub>2</sub> in these locations were not likely to exceed the National Air Quality Strategy objectives.

Aberdeenshire Council does not operate, nor does it have located within its boundaries, any automatic analysers or monitors for air quality. In addition, the Council does not undertake monitoring in respect of PM<sub>10</sub>, Sulphur dioxide, benzene, or other pollutants.

There is one monitoring site within Stonehaven at Allardice Street, which is classified as a Kerbside Type (OS Grid reference 387445, 785823). According to the Councils 2013 Progress Report, there were no exceedances of the NO<sub>2</sub> annual mean objective recorded at this location during 2012.

A number of potentially sensitive receptors to air quality have been identified on site and in the surrounding area, comprising:

- Residential properties (and hence residents) in the vicinity of the site;
- Visitors, including tourists, to the harbour and surrounding area;
- Commercial properties (and hence workers) in the vicinity of the site; and
- Schools, primary schools and preschools, the closest of which is 250m north west of the site.

### **C 11.3 Recommendations**

Any proposed redevelopment has the potential to affect ambient air quality including from the construction process (e.g. dust creation, HGV and plant emissions) and during operation (e.g. increased traffic emissions and additional plant emissions). Subject to the nature and scale of any proposed redevelopment or maintenance/repair works, a detailed assessment of air quality impacts may be requested by the Councils Environmental Health Department.

If required, this may include:

- Qualitative assessment of potential air quality impacts arising from construction works, together with specification of mitigation measures as appropriate (e.g. damping down materials, restriction/limiting HGV and plant use/emissions); and
- Quantitative assessment of impacts arising from operation, including from new traffic and plant, and specification of appropriate mitigation, where required.

Typically, the Design Manual for Roads and Bridges (DMRB) assessment method is used for less sensitive sites / developments, with the Atmospheric Dispersion Modeling System (ADMS) method used in more complex situations.

## **C12. Conclusions and Recommendations**

Based on the review of available information presented within this report, the following additional works are recommended in order to further clarify environmental constraints, or to assess the likely environmental impacts of proposed redevelopment of the site, as part of the planning process.

In the case of future maintenance and repair work at the site, the need for further environmental assessment and support should be discussed and agreed with the relevant authorities, including Aberdeenshire Council, Historic Scotland, SNH and SEPA, in advance of any such works commencing

Environmental Consideration	Recommendation
Landscape and Visual Amenity	A <b>Landscape and Visual Appraisal</b> may be required to support the design and planning processes for any proposed redevelopment. A <b>Seascape Visual Appraisal</b> may also be required.
Ecology	An <b>Extended Phase 1 Habitat Survey</b> should be undertaken to clarify potential ecological constraints to any redevelopment. Dependent upon the findings of this survey, additional detailed ecological surveys may be required to confirm the presence of protected or notable species.  Site specific <b>Bird Surveys</b> may be required to characterise the seasonal use and value of the Site to birds, as well as its connectivity to any sites designated for birds. Further survey may be required to characterise the distribution and sensitivity of <b>benthic habitats and species</b> within the vicinity of the site. This would include the presence of protected faunal and floral features. In relation to fish, <b>detailed consultation</b> with local District Salmon Fisheries Board and with Marine Scotland is recommended.
Archaeology and Built Heritage	A <b>Heritage Statement</b> should be undertaken prior to any redevelopment or maintenance/repair works. Intrusive evaluation and/or historic building appraisal may also be required.
Contaminated Land and Ground Gas	No significant risks have been identified however this should be confirmed by a <b>Preliminary Environmental Risk Assessment</b> , including detailed walkover survey and production of preliminary conceptual model to determine the potential existence of pollutant linkages.
Water Environment	Given the site's location within an indicative flood plain, it is recommended that further <b>flood risk assessment</b> works are undertaken to clarify any potential development constraints.
Transport	It is likely that further <b>Transport Assessment</b> work may be required, in addition to a strategy for marine access, to support planning and design for future redevelopment of the site.
Noise	A <b>Noise and Vibration Assessment</b> is recommended to quantify any associated constraints or issues associated with any redevelopment and to support planning.
Air Quality	<b>Air Quality Assessment</b> may be required to support planning depending on the scale and nature of proposed redevelopment works, which should be confirmed with the Council.

## PART D – REPORT SUMMARY AND RECOMMENDATIONS

## D.1 Report Summary

A combination of aging; consistently under maintained infrastructure, significant storm and weather deterioration, limited berthing and berth related facilities, restricted shore side access and development potential; inadequate vehicular access and capacity, poor financial prospects and an unknown capacity to attract developmental funding are among the challenges facing Stonehaven Harbour.

In contrast, the strong emotional attachment to it of the local population and visitors, its iconic status, picturesque views and topography; coupled with its history and the determination of its regular users to ensure its future, are all positive factors which may be translated into positive action and potentially positive outcomes.

Readers will be struck by the contradictions highlighted within this report according to which criteria are used as the baseline for decisions. Clearly there is a disparity between the technical, operational and economic factors impacting any potential redevelopment of Stonehaven Harbour.

From a technical perspective almost anything may be achieved, provided unlimited funding is available and fully utilised.

From an operational perspective the topography of the harbour and its geographical limitations, coupled with the unavailability of enabling development potential strongly mandates against major redevelopment.

The overall economic perspective provides enticing statistics encouraging redevelopment and holding out significant potential reward having done so. There is a clear economic rationale for investing in the harbour and developing a marina. The economic case is compelling, on the basis of the wider national research which found that the average expenditure per boat night was around £130, which could deliver a considerable financial impact to the local economy, and support new and existing jobs locally. There are significant wider more strategic economic benefits, including safeguarding the harbour's current business activities, promoting the attractiveness of the harbour as a tourism destination, growing other sectors as a result of investing in the harbour, potential new onshore developments and enhancing the overall attractiveness of Stonehaven as place to live, visit, invest and work.

Initial indicators suggest that the Environmental impact of any development, other than positive anti flood factors, is minimal, subject to further 'build specific' research at the appropriate time. (The cost of necessary specific environmental studies, which can be significant, should be factored in to any future plans.)

**The reality of the situation is a combination of all of the above with, arguably, the greatest single impacting ‘real’ factor being COST.**

Despite the contradictions within the study, one conclusion within each element is immediately apparent. The **‘Do Maximum’** option scores consistently high across all elements.

Taking this as the baseline decision factor, the answer appears simple – to undertake a full redevelopment of Stonehaven Harbour including, in order of priority, Building a new outer breakwater; undertaking an infrastructural mitigation process and creating a marina.

In order to complete such a programme, a comprehensive, intensive and complex capitalisation process would need to be undertaken.

We have already seen that the ‘usual’ enabling capacities do not apply to Stonehaven harbour, immediately removing the most effective capital raising lever and severely limiting capitalisation options. (Whether or not some strategic development plan encompassing areas outside the environs of the harbour could provide enablement is beyond the scope of this study, however we suggest that this should be considered when deciding the way forward.)

Similarly, the limitations of existing harbour topography restrict the potential vessel berths and the potential ‘operational income’ derived from them. The additional protected basin provided by a new outer breakwater would mitigate the low ‘operational income’ factor, however this is significantly offset by the huge costs of its construction.

Given the limited potential operational income, capitalisation based upon commercial lending is unlikely due to the projects subsequent inability to service that lending.

Consequently any capitalisation process will rely heavily upon grant funding. Grant funding is currently something of a lottery, with potential sources at EU; UK; National and Regional levels and a continuing fluctuation and variation of qualifying criteria.

Taking the full scope of the ‘Do Maximum’ option, the likely funding requirement would be somewhere between £40 - £50 million. Raising that amount solely through grants will be a full time job requiring significant resource and specialist knowledge.

Consequently the capacity to achieve ‘full funding’ is an unknown quantity, however, a possibility exists that some kind of staged funding process might be possible. This then requires an equally staged development program. Whilst we recognise the attraction of a ‘do maximum’ approach, we also recognise its probable lack of ‘real world’ achievability.

The study undertaken for this report undertook to present '... a sensible, reliable 'potentials' based examination of the feasibility of development at Stonehaven Harbour, which could then be utilised to move forward according to the determination of STP and consensus within the community' Our recommendations are made with this undertaking at the forefront of our consideration.

## **D.2 Recommendations**

**In light of the above the recommendation of PJ Consulting & Associates is:**

**That the Mitigation Plan outlined at para.4.4 be adopted as the base line of action to ensure the future viability of Stonehaven Harbour. Efforts to undertake its recommended repairs and refurbishments should be commenced as soon as practicable.**

**The recurring historic and iconic themes associated with the Harbour should be fully exploited in order to affect some increase to the income derived from day to day harbour operations, thereby contributing to improved sustainability.**

**Whenever financial factors permit, a balanced program of internal improvement should be undertaken which could include a limited increase in pontoon berths; especially within the inner basin, improved utilities provision and permanent welfare facilities in the form of showers; toilets and laundry provision, facilitating a more realistic pricing structure for permanent and visitor berthing.**

**The proposed expansions associated with the Tollbooth Museum and Stonehaven Sea Cadets present an opportunity for Stonehaven Harbour, which should be exploited in full, whilst the thriving ASYC could be encouraged to diversify and increase their offering within the leisure and training market**

**Whilst we recommend the above actions as eminently achievable, we recognise that stakeholders might wish to attempt a 'do maximum' solution. Nothing in our recommendations precludes such an attempt, however there are significant odds against its achievement, which prevents us recommending it as a course of action.**