

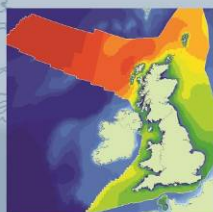
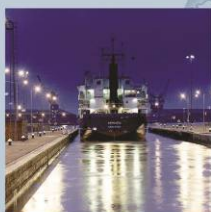
Fisher Associates

Oban Navigational Risk Assessments

Report R.2265

June 2014

Creating sustainable solutions for the marine environment



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Fisher Associates

Oban Navigational Risk Assessments

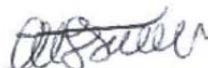


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Quality Manager:	T Auld		20.06.2014
Project Director:	C E Brown	PP N S. K 	20.06.2014

ABP Marine Environmental Research Ltd
Quayside Suite, Medina Chambers, Town Quay, Southampton, Hampshire SO14 2AQ

Tel: +44 (0) 23 8071 1840
Web: www.abpmer.co.uk

Fax: +44 (0) 23 8071 1841
Email: enquiries@abpmer.co.uk

ABPmer is certified by:



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Summary

Oban Bay is located on the West Coast of Scotland within the Firth of Lorn. The Bay in which the town of Oban is situated occupies a strategically important location for maritime traffic, having two natural harbour approaches. The Bay is busy with maritime traffic operating from a range of piers, jetties, slipways, pontoons and moorings.

Caledonian Maritime Assets Ltd (CMAL) working in partnership with Argyll and Bute Council (A&BC) and the Northern Lighthouse Board (NLB) has commissioned Fisher Associates to provide a Harbour Management Plan for Oban Bay. As part of this Plan, a requirement to evaluate navigational risk within Oban Bay and the Sound of Kerrera was identified. ABP Marine Environmental Research Ltd (ABPmer) was commissioned to complete this exercise.

The initial Navigational Risk Assessment (NRA) hazard scenario identification was undertaken on the 20 March 2014 during a site visit to Oban. Harbour Stakeholders were consulted through a sequence of meetings held at local offices, and within an open forum at the Corran Halls. To inform the NRA, the study compiled available navigational accident and incident records, characterised vessel transit routes within the study area, and drew-up a list of hazard scenarios for assessment.

In total, 43 assessments were made which were presented as a ranked hazard scenario list. The NRA process summarised risk control options that are currently used, and identified a range of 'future risk control options' through consultation with harbour stakeholders. It should be noted that this NRA does not advocate any particular course of action, but has identified 'future risk control' measures to ensure the reader has a clear understanding of the available options.

Acknowledgements

The study team would like to acknowledge the kind assistance offered a range of harbour users in Oban, specifically in supplying accident and incident records and contributing to the Navigational Risk evaluation process. The following list identifies contributors:

Argyll and Bute Council (A&BC):	Marine Operations Manager - Martin Gorringe Harbour Master (North Pier) - Vicki Mckenzie
Caledonian Maritime Assets (CMAL):	Director of Harbours - Lorna Spencer
CalMac Ferries Ltd (CalMac):	Head of Marine - Guy Dale-Smith Area Operations Manager - Finlay MacRae Head of Harbours - Alasdair Henderson Master, Loch Riddon - Robert Carmichael
Coastal Connection LLP:	Cameron Smith Struan Smith
John MacAlister (Oban) Ltd:	John MacAlister
Loch Lomond Seaplanes:	Chief Pilot - David West
Marine Accident Investigation Branch (MAIB):	Database Administrator - Cathy Pennock
Maritime and Coastguard Agency (MCA):	Marine Surveyor - William Forsyth Sector Manager - Kenny Devine
Northern Lighthouse Board (NLB):	Director of Marine Operations - Capt. Phillip Day Marine Operations Manager - Ewen Mackerchar
Oban Marina & Yacht Services Ltd:	Finance & Administration Manager - Karen Ray Marina Manager - Neil Price
Royal National Lifeboat Institution (RNLI):	Service Information Section - Roger Aldham Oban Lifeboat Operations Manager - Billy Forteith Mike Robertson
Royal Yachting Association (RYA) Scotland:	Senior Administrator - Pauline McGrow
Sea Kayak Oban:	Stuart Wagstaff
West Highland Anchorages and Moorings Association (WHAM):	Secretary - David Vass

Abbreviations

A&BC	Argyll and Bute Council
ABPmer	ABP Marine Environmental Research Ltd
AIS	Automatic Identification System
AIS-A	Shipborne mobile equipment intended for vessels meeting the requirements of IMO AIS carriage requirement.
AIS-B	Shipborne mobile equipment intended for non-IMO AIS vessels (for example, small commercial vessels below 300 GT, fishing vessels, recreational vessels)
ALARP	As Low As Reasonably Practicable
CMAL	Caledonian Maritime Assets
CalMac	CalMac Ferries Limited
CD	Chart Datum
CHA	Competent Harbour Authority
DfT	Department for Transport
Fq	Frequency
GT	Gross Tonnes
GtGP	Guidance to Good Practice
HM	Harbour Master
HAT	Highest Astronomical Tide
HDPC	Harbour, Docks, Piers and Clauses Act
HSE	Health & Safety Executive
IMO	International Maritime Organization
Lat	Latitude
LAT	Lowest Astronomical Tide
Long	Longitude
MAIB	Marine Accident Investigation Branch
Marine-SMS	Marine Safety Management System
MCA	Maritime and Coastguard Agency
MHWS	Mean High Water Springs
MGN	Marine Guidance Note
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MoU	Memorandum of Understanding
MSL	Mean Sea Level
NLB	Northern Lighthouse Board
NRA	Navigational Risk Assessments
PECs	Pilotage Exemption Certificates
PMSC	Port Marine Safety Code
RIB	Rigid-hulled Inflatable Boat
RNLI	Royal National Lifeboat Institution
Ro/Ro	Roll-on, Roll-off (vessel type)
RYA	Royal Yachting Association
SHA	Statutory Harbour Authority
UKHO	UK Hydrographic Office
WHAM	West Highland Anchorages and Moorings Association

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

Oban Navigational Risk Assessments

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1. Background and Study Brief

1.1 Oban

Oban Bay is located on the West Coast of Scotland within the Firth of Lorn. The Bay in which the town of Oban is situated occupies a strategically important location for maritime traffic, having two natural harbour approaches, namely the North Channel and the longer Sound of Kerrera, providing a sheltered approach from the South. The natural harbour is busy with maritime traffic operating from a range of piers, jetties, slipways, pontoons and moorings.

1.2 Study Brief

Caledonian Maritime Assets Ltd (CMAL) working in partnership with Argyll and Bute Council (A&BC) and the Northern Lighthouse Board (NLB) has commissioned Fisher Associates to provide a Harbour Management Plan development plan for Oban Bay. As part of this Plan, a requirement to evaluate navigational risk within Oban Bay and the Sound of Kerrera was identified. ABP Marine Environmental Research Ltd (ABPmer) was commissioned to complete this element of work.

The study brief required the creation of a comprehensive set of Navigational Risk Assessments (NRAs) to the standard required by the Port Marine Safety Code (PMSC) (DfT, 2012) using assessment methods outlined in the PMSC accompanying 'Guidance to Good Practice' (GtGP) (DfT, 2013). The scope of the NRA exercise was designed to cover all marine vessel traffic operations, using a broad range of harbour stakeholder experience to inform the hazard identification and assessment process. Following the identification of hazard scenarios, a series of proposed mitigation measures were required, aimed at improving marine safety and allow better management of marine risk. The outputs of the NRA process informed the short-term measures proposed in the Fisher Associates Harbour Management Plan.

1.3 Study Area

The study area includes the area covered by the voluntary 'Code for Safe Navigation in and around Oban Bay'. This is described as an area bounded by a line drawn from the North-West tip of Kerrera to the North-West tip of Maiden Island and to the South by a line drawn East-West through Sgeirean Dubha light tower (Cutter Rock Beacon). This includes the Sound of Kerrera and Oban Bay, see Figure 1.

1.4 Study Team

The study team identified in the scope of work and agreed with Fisher Associates upon commissioning included the following principal project personnel:

Claire Brown - Project Director; with 30 years of experience in port research, project management and direction;

Monty Smedley - Project Manager; a Marine Risk specialist with 16 years of port marine risk and navigation research experience; and

Capt. Trevor Auld - Master Mariner; with 30 years of ports industry experience in a range of roles including ABP Harbour Master for South Wales ports and towage manager for Red Funnel.

ABPmer has 60 years port related research and consultancy experience, part of this experience and understanding comes from ABPmer's position as a wholly-owned subsidiary of Associated British Ports Holdings Ltd, the owner and operator of 21 Ports within the UK.

1.5 Report Structure

The study brief as detailed overleaf, has been interpreted into the following report sections. These sections form the body of the report and are supported as necessary by technical Appendices. Report sections include:

Section 1: Introduction (this Section);

Section 2: Navigation Baseline Understanding; and

Section 3: Navigational Risk Assessment Summary.

2. Harbour Navigation Baseline Understanding

The following report Section outlines the current and recent navigational situation in the study area and draws together information relevant to undertaking the navigational risk assessments.

2.1 Harbour Authorities, Berth and Mooring Operators

There are two separate Harbour Authorities within Oban Bay, these are Argyll and Bute Council (A&BC) who own and operate the North Pier, and Caledonian Maritime Assets (CMAL) who own the Railway Pier and the South Pier.

The A&BC owned and operated North Pier is a general use facility for commercial and recreational vessels. The pier facilities and disembarkation slipways are routinely used for visiting cruise liner traffic, which typically tenders passengers ashore. CalMac Ferries Limited (CalMac) is the terminal operator for the Oban harbour facilities owned by CMAL. Oban is the central hub port for the operation of lifeline ferry services with connections to Lismore, Colonsay, Coll and Tiree, and the ports of Craginure on Mull and Castlebay on Barra. The Bay also has an established fishing fleet based mainly at the South Pier, with further aquaculture vessels using the North Pier and anchoring near Heather Island (in the Sound of Kerrera).

Further commercial berthing facilities are available at the Northern Lighthouse Board (NLB) owned and operated support base. This facility is located on the South side of Oban Bay and provides facilities for ship berthing, painting and repairing buoys, landing and refuelling helicopters, plus a range of engineering support services. The NLB also offer a limited commercial berthing service, which is predominantly used by smaller cruise vessels.

Between the South Pier and the NLB Pier, the RNLi lifeboat station operates a berth for its Trent Class Lifeboat 'Mora Edith MacDonald'.

Oban Bay is also busy with recreational traffic, the main provider of berthing facilities is Oban Marina and Yacht Services Ltd, which owns and operates a 150 vessel capacity pontoon/mooring facility located on the Island of Kerrera adjacent to the North Channel entrance to Oban Bay. Visiting cruising vessels can also make use of the many privately owned and association owned single point moorings within the wider Oban Bay area, adding further to the recreational traffic. Yacht and dinghy racing occurs in Oban Bay, much of which is organised by Oban Sailing Club who run dinghy sailing within the Bay and yacht races from their clubhouse to a range of local island venues. Larger organised events (for example, the West Highland Yachting Week, the Scottish Islands Peaks Race and the Classic Malts) also visit Oban at specific points in the racing calendar. The Bay is also extensively used by smaller craft, including RIBs, dive boats and divers, kayaks, canoes and personal jet water craft.

Oban Bay also has a history of use by aviation. The Bay used to host a regular passenger service operated by Loch Lomond Seaplanes flying to a range of destinations including Glasgow. Information on UK Hydrographic Office (UKHO) chart 1790 identifies the indicative 'Seaplane Operating' area. At the time of carrying out this study, a regular passenger service was not in operation, however charter flights could land in Oban Bay at any time and therefore

it is relevant to consider flying boats within the context of navigation within Oban Bay. The NLB support base also incorporates a helipad, the operation of which has been considered within the scope of the study to recognise the potential for interaction between aircraft and vessels in the near vicinity.

2.2 Vessel Density and Marine Traffic Routeing

The principal commercial traffic in the study area is passenger ferries and roll-on, roll-off ferries (Ro/Ro) operated by CalMac. The ferries berth at the Railway Pier, and take a range of routes into and out of the study area, depending on their destination and the prevailing weather conditions. Table 1 provides a summary of vessel movements within the Bay compiled by Fisher Associates for the years 2010 to 2013.

Table 1. Vessel Movement History - Oban Bay

Location	2010	2011	2012	2013
North Pier	1,064	1,936	1,092	1,386
Railway Pier	8,230	8,098	8,160	8,108
South Pier	2,920**	2,920**	2,920**	2,920**
NLB Pier	722	714	984	683
Oban Marina	2,000*	2,000*	2,000*	2,000*
Oban Marina Ferry	8,760	8,760	8,760	8,760
Private Moorings*	100*	100*	100*	100*
Total	23,769	24,528	24,016	23,957
* Estimation				
** 12 registered Fishing Boats, estimated based on 4 boats moving on average per day				

(Source: Fisher Associates, 2014)

This table does not include vessel movements from smaller craft such as kayaks, tenders and dinghies. Also, large organised events such as West Highland Week can attract fleets of upwards of 100 competitors, and a range of support craft which are not recognised in Table 1. Anecdotal information identified July as the peak month for vessel movements, however the summer months in general can see vessel numbers double to that seen in winter months.

To inform the NRA process, Automatic Identification System (AIS) records from the Maritime and Coastguard Agency's (MCA) network of AIS receivers was made available to the study. The data was supplied from a selection of months during the year to enable consideration of seasonality. The following periods of data were provided:

2012: 3rd to 9th January; and

2012: 1st to 7th from each of the following: Mar, May, Jul, Sep and Nov.

AIS information can be broadly classified as 'Class A' and 'Class B'. AIS-A is carried by international voyaging ships with gross tonnage (GT) of 300 or more tonnes, and all passenger ships regardless of size. AIS-B is a non-mandatory form of AIS typically used by small commercial craft, fishing vessels and recreational vessels. By joining together AIS position locations, a single transect line for each vessel voyage can be created.

Figure 2 shows the individual vessel tracks (or transits) created from the MCA data. These transits have been split into four main vessel types using the study area. It can be seen from Figure 2 that passenger vessels (including ferries and cruise ships) use deep water routes into and out of Oban Bay. Along the Sound of Kerrera vessels will keep to the West of Ferry Rocks and then take one of two tracks to their berth (either West or East of 'Sgeir Rathaid'), depending on the vessel draught and the tidal state. Cargo vessels typically berth at the North Pier, and follow very similar routes to passenger vessels. Fishing vessels mostly berth at the South Pier, and follow the most direct route to their fishing grounds. It should be noted that the use of AIS is not mandatory for smaller fishing vessels, and therefore the vessel transits shown here should be seen as indicative routes only and do not present a complete record of all fishing vessels using the area. Recreational vessels show a wider use of the study area, with routes along the Sound of Kerrera which pass to the West and East (and over) Ferry Rocks. A high percentage of recreational vessel traffic shown on Figure 2 is heading to, or from, Oban Marina. Recreational vessels visiting North Pier or South Pier are often doing so to take on fuel or stores, rather than overnight berthing.

Figure 3 provides an average density grid of vessel transits (movements) within the study area. The density grid cell size is 25m by 25m, and created from the same 42 days of AIS-A and AIS-B data shown in the transit line Figure. The average density grid allows the identification of the busiest area of the study area shown as 'Position A', which is located in the northern approaches to Oban Bay. The embedded table within Figure 3 shows the summer/winter weekly peak count for a range of grid cells across the Bay; as an example 'Position A' shows a peak of 113 transits per week (16 per day) in summer, and a winter peak count which is around half of this at 54 transits. Whilst the density grid gives a good depiction of the water space use by vessels carrying AIS transponders, it should be noted that a range of non-AIS vessels, which are typically smaller (i.e., RIBs, kayaks, tenders, dinghies) are not represented within the pattern of water space use presented by the grid.

Figures 4 and 5 show vessel density grids using July as a representative 'busy' summer month (Figure 4) and January as a comparative winter month (Figure 5). The key difference between summer and winter months is the very limited recreational traffic in winter.

As a further view on traffic patterns in the study area, Tables 2 and 3 show a split of transit counts passing through northern entrance to Oban Bay (Table 2) and through the Sound of Kerrera (Table 3). Tables 2 and 3 show that the bulk of traffic uses the northern approaches to Oban Bay, which accords with the experience of harbour stakeholders who consider that the northern approaches to Oban Bay is most regularly used, probably due to the shorter distance and the simpler passage into Oban Bay.

Of the vessel traffic using the northern approaches (Table 2) around 85% of this is made up of passenger vessels, 7% from recreational craft and 3% from cargo vessels. The 'unknown' percentage is vessels which have not transmitted their vessel type as part of the AIS message. In reality, the percentage of recreational and fishing vessels is likely to be much higher, but this is not represented in AIS data.

Table 2. Northern Transect: Across the Oban Bay Northern Approach Channel

Vessel Type	Transit Count 42-Day AIS Record	%
Unknown (type could not be identified)	20	2.1
Non-Port service craft	1	0.1
Port service craft	2	0.2
Vessels engaged in dredging or underwater operations	18	1.9
Passenger vessels	795	84.8
Cargo vessels	27	2.9
Fishing	12	1.3
Sailing and Pleasure craft	62	6.6
Total	937	

Table 3. Southern Transect: Across the Sound of Kerrera at Heather Island

Vessel Type	Transit Count 42-Day AIS Record	%
Unknown (type could not be identified)	16	12.6
Non-Port service craft	1	0.8
Port service craft	1	0.8
Vessels engaged in dredging or underwater operations	9	7.1
Passenger vessels	53	41.7
Cargo vessels	6	4.7
Fishing	2	1.6
Sailing and Pleasure craft	39	30.7
Total	127	

From the vessel traffic using the South of Kerrera (Table 3) around 53% of this is made up of passenger vessels, 40% from recreational craft and 9% from vessels engaged in dredging or underwater operations.

2.3 Accident and Incident Data

Accident and incident data for the study area has been collected and compiled into one list, which is shown in Appendix A. This list is an amalgamation of information provided by the RNLI's central database, Oban Lifeboat Station records, MCA information, MAIB National archive reports, CalMac records and NLB records. The information in Appendix A identifies the source of each record. As the list has been compiled from a number of different sources, duplicate records were observed, so to help remove duplicate records the incident date was used as a filter, and duplicate records were removed. The majority of records came with geographic references, coordinates or descriptions. Where coordinates were provided, the records have been presented on a chart, shown in Figure 6. It should be noted that not all records had coordinates – some records were simply recorded as 'Oban Bay' or 'Sound of Kerrera'. Where other aspects of information were available (i.e., the weather conditions) this has been kept.

Figure 6 shows the distribution of accidents and incidents around the study area. Clusters of incidents can be seen around Maiden Island which are mainly machinery failure, Corran

Ledges which is typically occurrences of grounding, Oban Marina incidents which usually relate to illness or injury to crew, Oban town frontage which is typically dangers of drowning, and Ferry Rocks which has a history of grounding incidents. Various other ad hoc incidents are noted throughout the study area. For locations see Figure 1.

The records presented in Appendix A cover the period of 1994 to 2013, which represents a 20-year history of marine accidents and incidents within the study area. This information has been summarised in Table 4, and presented by incident type with the recorded frequency of occurrence. To make this data record relevant to the NRA process, the column 'NRA Fq' has been added to link with the assessments presented in Section 3 and 4 of this document, and a final description column to summarise each incident type.

Table 4. Accident-Incident Summary 1994 to 2013

Incident Type	Count	Data Frequency (Fq)	NRA Fq	Fq Description
Accident to person	22	0.9	Yearly	Frequent
Adrift/Tow	4	5.0	5	Occasional
Ambulance or doctor call	1	20.0	25	Remote
Capsize	3	6.7	10	Infrequent
Collision	6	3.3	5	Occasional
Diver recovered	1	20.0	25	Remote
Dragged anchor	1	20.0	25	Remote
Fire	3	6.7	10	Infrequent
Fouled propeller / impeller	2	10.0	10	Infrequent
Hazardous incident	6	3.3	5	Occasional
Ill crewman on vessel	8	2.5	5	Occasional
Impact with structure	3	6.7	10	Infrequent
In danger of drowning	5	4.0	5	Occasional
Injury/Hit by prop	1	20.0	25	Remote
Leaks/Swamping	2	10.0	10	Infrequent
Machinery failure	28	0.7	Yearly	Frequent
Near miss (collision)	3	6.7	10	Infrequent
Person in distress	1	20.0	25	Remote
Person overboard	3	6.7	10	Infrequent
Pollution	2	10.0	10	Infrequent
Ranging	1	20.0	25	Remote
Recovery of dead human body	2	10.0	10	Infrequent
Steering failure	2	10.0	10	Infrequent
Grounding	36	0.6	Yearly	Frequent
Thought to be in trouble	1	20.0	25	Remote
Total	147			
Explanatory note on terms used: "Collision" Vessel hits another vessel that is floating freely or is anchored (i.e. not tied up alongside). "Dragged anchor" An anchored vessel's anchor moves along the seabed, resulting in the vessels position changing. "Hazardous incident" Means any event, other than an accident, associated with the operation of a ship which involves circumstances indicating that an accident nearly occurred. "Impact with structure" Vessel hits an object that is immobile and is not subject to the collision regulations e.g. buoy, post, dock (too hard), etc. Also, another ship if it is tied up alongside, also floating logs, containers etc. "Near miss (collision)" A close quarters situation with another vessel, which could have resulted in a Collision. "Ranging" Excessive movement of a moored vessel, due to interaction with another vessel passing at speed and/or in close proximity.				

It should be noted that whilst Table 4 provides a summary of the information gathered during the Stakeholder engagement phase of this project, some of the categories are non-navigational

(for example, ‘ambulance or doctor call’) and are included within the Table for completeness. Only relevant navigation categories/frequency counts have been used in the NRAs. It is also important to note the types of vessels involved in the accidents and incidents within the study area. Table 5 provides a summary count and records the percentage of vessels represented in the total dataset.

Table 5. Accident-Incident Vessel Type Summary 1994 to 2013

Vessel Type	Count	Percentage of Data Record
Commercial/Cruise	1	0.7
Commercial/Divers	1	0.7
Commercial/Ferry	24	16.7
Commercial/RIB	1	0.7
Commercial/Workboat	1	0.7
Commercial/Cargo	5	3.5
Commercial/Other	11	7.6
Fishing/Commercial	31	21.5
Fishing/Leisure	3	2.1
Leisure	12	8.3
Leisure/Dinghy	4	2.8
Leisure/Diving	2	1.4
Leisure/Motorboat	3	2.1
Leisure/Sailing	24	16.7
Person	4	2.8
Person/Swimming	3	2.1
Shore Facility (Pier)	1	0.7
Unknown	13	9.0
Total	144	100.0

Table 5 demonstrates that commercial fishing vessels are involved in the highest percentage of incidents, with sailing vessels and ferries as the (joint) second placed category. These percentage values must be considered in combination with vessel movement figures shown in Table 1. Ferry and recreational (sailing) traffic provide a significant proportion of vessel movements within the study area, and therefore it would be anticipated that incident counts for these types of vessels are consequently greater.

It should be noted that whilst this NRA has pooled together available navigational accident and incident data, the lack of one comprehensive database for Oban Bay provides some uncertainty to the frequency values (Table 4). It is likely that a number of accidents and incidents are missing from the list, and that the frequency of some categories should be higher. In addition, as most of Oban Bay is outside of a harbour area, it is likely that near-misses (close quarters situations) are significantly under-represented. In most harbours that are regulated by a Harbour Authority, a near miss reporting procedure captures a wider range of potential incidents; this acts as a very useful prompt to pro-actively consider measures for reducing risk.

2.4 Navigational Control

The existing Harbour Authority boundaries, limited to some 50 feet off facilities, allow the exercise of duties and powers over these small areas in the Bay. This provides principally for Harbour Masters and their deputies to manage vessel traffic through the provisions of the 1847 'Harbour, Docks, Piers and Clauses Act' (1847 HDPC Act) and any specific provisions provided for in their enabling (or subsequent) Acts. The most relevant Clause from the 1847 HDPC Act is Section 52, which provides the powers for Harbour Masters to manage vessel traffic.

Harbour Authorities have duties and responsibilities that relate to their SHA areas and the approaches to their SHA areas. In respect to marine safety, the PMSC and the accompany GtGP identifies that Harbour Authorities are to develop procedures for managing major aspects of marine safety within their port (including the approaches). This includes documenting how risk assessments are carried out and the emergency response procedures that will come into force in the event of an incident. Within the SHA, Harbour Authorities are responsible for managing marine operations; which for practical application means the moving, berthing and unberthing of ships and other marine craft. In addition to marine safety, further duties and responsibilities of Harbour Authorities cover conservancy functions including anchorages (appropriate provision for safe anchorages in the SHA and its approaches), wrecks (powers to raise, remove, destroy and mark a wreck which is, or is likely to become a danger to navigation) and the provision of aids to navigation. Additionally, Harbour Authorities may also apply to be a Competent Harbour Authorities (CHA) for the provision of pilotage within a defined area and the approaches to that area.

The safety of navigation in areas outside of the Harbour Authority boundaries, is presently managed through the application by individual vessel Masters of international standards (such as the International Regulations for Preventing Collisions at Sea 1972 (Colregs)) and through the voluntary 'Code for Safe Navigation in and around Oban Bay' created by harbour stakeholders. The responsible authority for navigational safety outside of Harbour Authority boundaries is the MCA.

3. Navigational Risk Assessment Summary

The following section details the assessments undertaken for the study area, the methods used, assessment findings and the risk control measures identified.

3.1 Stakeholder Consultation

The initial Navigational Risk Assessment hazard scenario identification was undertaken on the 20 March 2014 during the site visit. The following organisations were consulted during the site visit, or shortly after by email and phone:

A&BC;
CMAL;
CalMac;
Coastal Connection LLP;
Loch Lomond Seaplanes;
John MacAlister (Oban) Ltd;
MCA;
NLB;
RNLI;
RYA Scotland;
Sea Kayak Oban; and
WHAM.

The resultant assessments were based on qualitative information and expert judgement using the collective expertise of harbour users, marine port staff working in Oban Bay, and marine risk management experience from the ABPmer team.

Following the 20 March 2014 site visit, the assessments were further reviewed and compared against existing Risk Controls in a visit on the 7 April 2014. This visit also used with the same harbour Stakeholder invitee list, and sought to explore future Risk Control options that could be used within the study area.

The NRA and full assessment details are shown in Appendix B; a summary of the assessment findings is contained within this report Section.

3.2 NRA Methodology

The first part of the assessment exercise identified a hazard scenario list using previous accident and incident reports, harbour stakeholders and port staff expertise; plausible 'Causes' for each hazard scenario were then identified and listed.

For each hazard scenario under assessment, the 'Most Likely Scenario' and the 'Worst Credible' scenario were described. Using a range of hazard scenario outcomes enables a balanced view of frequency of occurrence and consequence to be applied. Existing 'Risk

Controls' were identified by port staff and noted against each hazard scenario assessment to present a complete view of the existing risk management process. The identified hazard scenarios were then assessed using risk matrices which identify human, environment, port business and property consequences. This process follows the recommended approach for assessments detailed within the PMSC Guide to Good Practice (DfT, 2013).

The matrix descriptions were discussed with the stakeholder group, and presented at each public meeting for comment. Suggested changes were incorporated into the frequency and consequence descriptions to meet the size and scale of marine operations in the study area. Table 6 identifies these frequency and consequence descriptions.

Table 6. Frequency and Consequence Descriptions Used in the NRA

Category	People	Property	Planet	Port Business
0	None	Negligible (£0 - £2,000)	None	None
1	Minor (Single slight injury)	Minor (£2,000 - £10,000)	Minor (No discernable effect)	Minor (£0 - £2,000 - Little local publicity. Minor damage to reputation. Minor loss of revenue)
2	Moderate (Major or multiple slight injuries)	Moderate (£10,000 - £100,000)	Moderate (Local impact from a small scale pollution event)	Moderate (£2,000 - £20,000 - Negative local publicity. Moderate damage to reputation. Moderate loss of revenue)
3	Serious (Multiple major injuries)	Serious (£100,000 - £1,000,000)	Serious (Significant effects from a large scale pollution event)	Serious (£20,000 - £200,000 - Negative national publicity. Serious damage to reputation. Serious loss of revenue)
4	Major (One or more fatalities)	Major (> £1,000,000)	Major (Catastrophic / widespread pollution event needing major outside assistance)	Major (> £1,000,000 - Negative national and international publicity. Major damage to reputation. Major loss of revenue)

The resulting scores from each assessment provide a ranked 'Hazard Scenario List' as identified within Sections 3.5 to 3.7 of the PMSC (DfT, 2012).

Following the hazard scenario scoring and evaluation, potential 'Risk Reduction Measures' were identified and added to the assessment. It should be noted that a cost benefit analysis of potential Risk Reduction Measures was not part of the NRA process; Section 3.5 of the PMSC identifies that 'where appropriate, [Harbour Authorities should] consider a cost-benefit

assessment of risk reducing measures'. Should any risk reduction measures be applied in the future, the assessments should be updated accordingly.

Following the completion of the NRA process, each Hazard Scenario has been evaluated using the evaluation criteria shown in Table 6, the resultant score provides a one-to-ten scale means to rank each Hazard Scenario against the others within the list. The scoring and descriptive definitions that have been applied are given in Table 7.

Table 7. Hazard Scenario Score Description

Score	Definition
9 to 10	High Risk
6 to 8.99	Significant Risk
3 to 5.99	As Low As Reasonably Practicable (ALARP)
1 to 2.99	Low Risk
0 to 0.99	Negligible Risk

3.3 Hazard Scenario Results

In total, 43 assessments were identified and a number of these assessments had the same overall position within the ranked table. The highest scored hazard scenario(s) was shared between two assessments, these were:

Grounding of Recreation/Fishing vessels in the northern approaches or Oban Bay (including Corran Ledge and Sgeir Rathaid); and
Confusion over Buoyage at Ferry Rocks leading to Grounding.

The second highest scoring hazard scenario was:

Large vessel impact with infrastructure (for example, during berthing).

The full ranked list is shown in Table 8, the full assessments are shown in Appendix B.

Table 8. Hazard Scenario Ranked List

Pos.	Category	Hazard Scenario	Score
1	Grounding 3	Recreation/Fishing vessel grounds on a drying area in the northern approaches, or Oban Bay, including 'Sgeir Rathaid' and Corran Ledge.	5.63
1	Other (Confusion over Buoyage)	Confusion over buoyage, vessel on a passage through The Sound of Kerrera at Ferry Rocks.	5.63
2	Impact with infrastructure	Large vessel (i.e., ferry, cruise, cargo, large fishing) impacts heavily with quay during berthing.	5.19
3	Grounding 5	Large vessel (i.e., ferry/cruise/cargo) grounds on a drying area in Oban Bay, including 'Sgeir Rathaid'.	5.13
3	Grounding 2	Large Vessel (ferry/cruise/cargo) runs aground on a drying area in The Sound of Kerrera, including Ferry Rocks, Heather Island and 'Sgeir an Fheurain'.	5.13
4	Collision 1	Large vessel (i.e., cargo) collides with another large vessel (i.e., ferry/cruise) in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	4.88

Pos.	Category	Hazard Scenario	Score
5	Other (Mooring failure)	Unlit vessel (of more than 20 metres LOA) secured to a mooring or alongside breaks free at night.	4.63
6	Grounding 1	Recreation/Fishing vessel grounds on a drying area within The Sound of Kerrera, including Ferry Rocks, Heather Island and 'Sgeir an Fheurain'.	4.56
6	Grounding 4	Large vessel (i.e., ferry/cruise/cargo) grounds on a drying area in the northern approaches, including Corran Ledge.	4.56
7	Collision 4	Small craft (yacht/RIB/Powerboat) collides with a large floating object or navigation buoy in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	4.44
7	Mechanical Breakdown (large vessel)	Large vessel (ferry, cruise, cargo, large fishing) experiences serious mechanical failure in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	4.44
8	Mechanical Breakdown (small craft)	Small vessel (yacht/RIB/Powerboat) experiences serious mechanical failure in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	4.19
9	Other (Traffic Density/Anchorages)	Two vessels manoeuvring around a cruise vessel at anchor in Oban Bay do not have line-of-sight of one another.	4.06
10	Fire/Explosion 1	Fire on-board a commercial vessel (ferry/cruise/cargo).	4.00
10	Fire/Explosion 3	Outbound ferry carrying incorrectly declared hazardous goods (considered as cargo when on-board the ferry) explodes.	4.00
11	Sinking/capsized 3	Recreation/Fishing vessel - anchored or moored (unattended) has a sudden ingress of water.	3.88
12	Sinking/capsized 2	Recreation/Fishing vessel - berthed alongside (unattended) has a sudden ingress of water.	3.81
12	Other (vessel adrift)	Vandals release or cut through mooring lines of unmanned vessels secured to quays, jetties, piers or moorings.	3.81
12	Other (Dragging Anchor)	Large Cruise vessel at anchor in Oban Bay drags its anchor	3.81
13	Aircraft operations (Helicopter)	Helicopter blade strike with vessel superstructure on take-off/landing at NLB.	3.63
13	Person in Water (Swimmers)	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a swimmer.	3.63
14	Ranging 1	Large vessel (i.e., ferry, cargo, large fishing) passes moored vessels at speed.	3.56
15	Collision 3	Small craft (yacht/RIB/Powerboat/kayak) collides with a large vessel (i.e., ferry/cruise/cargo) in the northerly approaches to Oban Bay or within Oban Bay.	3.50
15	Collision 5	North bound yacht fleet (racing) in collision with a large south bound vessel (i.e., ferry/cruise/cargo) in the northern approaches to Oban Bay.	3.50
15	Aircraft operations (Seaplane) 5	Seaplane (on take-off) collides with small vessel (yacht/RIB/Powerboat/kayak) at speed.	3.50
16	Sinking/capsized 1	Large vessel (i.e., ferry/cruise/cargo) has sudden ingress of water whilst alongside a quay, jetty or pier.	3.44
16	Aircraft operations (Seaplane) 4	Seaplane (on take-off) collides with large vessel at speed.	3.44
17	Collision 2	Small craft (yacht/RIB/Powerboat/kayak) collides with a large vessel (i.e., ferry/cruise/cargo) in The Sound of Kerrera.	3.19
17	Pollution	Pollution from bunkering (refuelling) operations within Oban Bay.	3.19
18	Sinking/capsized 4	Small fishing vessel recovering gear takes on water.	3.13
18	Fire/Explosion 2	Fire on-board a recreational/fishing boat.	3.13
18	Person in Water (Recreation Diving)	Recreational diver in the water is overrun by a passing vessel.	3.13

Pos.	Category	Hazard Scenario	Score
18	Stranding	Extended period aground - large cruise vessel runs aground and does not lift on the next tide.	3.13
19	Aircraft operations (Seaplane) 1	Seaplane (landing) collision with large vessel (ferry, cruise, cargo, large fishing).	3.06
19	Aircraft operations (Seaplane) 2	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/kayak).	3.06
20	Aircraft operations (Seaplane) 3	Seaplane collides with vessel whilst taxiing.	3.00
20	Other (Wash)	Large vessel (ferry/cruise/cargo) on passage through The Sound of Kerrera / Oban Bay creates excessive wash.	3.00
21	Collision 6	Tendering operation from anchored cruise vessel to shore disembarkation location, leading to increased collision/sinking potential.	2.94
22	Ranging 2	Large vessel (i.e., ferry, cargo, large fishing) passes moored small craft (yacht/RIB/Powerboat) at speed.	2.88
22	Other (Fouled propeller)	Small vessel underway at night crosses a line of creel pots laid across the main shipping channel.	2.88
23	Person in Water (Commercial Diving)	Injury to commercial diver in water whilst vessel manoeuvring in the vicinity.	2.63
24	Person in Water (Scallop Diving)	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a scallop diver.	2.56
25	Collision 7	Fast craft (i.e., RIB, Dory, Speedboat, Personal Water Craft) in collision with a small low profile craft (i.e., kayak, canoe, small tender, inflatable) at speed.	2.13

3.4 Existing Risk Controls

A summary of existing Risk Controls for the whole assessment exercise were compiled into tables and presented in Appendix C. In total 24 existing Risk Controls were identified. The top five Controls in the study area are identified in Table 9.

Table 9. Most Commonly Selected Risk Controls (Top Five)

Pos.	Existing Controls	Count
1	62 Emergency services/shoreside equipment - RNLI and Coastguard.	35
2	3 Communications - traffic broadcast ch.16.	34
3	19 Emergency Plan - Local Council (CARP).	34
4	36 Availability of pollution response equipment.	32
5	69 Training of pollution response personnel.	31
Note: The count identifies the number of times the control was identified in the NRA process		

3.5 Future Risk Reduction Measures

As part of the assessment process, a compilation of potential 'Future Risk Controls' (Risk Controls which could be employed in the future) were identified and considered, these are presented in full in Table 10. The potential Risk Reduction Measures used the same identification references as used for the existing Risk Controls for ease of selection. Additional Future Risk Controls were identified during the assessment process and were added to the listing. It should be recognised that this part of the assessment process does not consider cost

implications of introducing new measures, however the listings can be used as an input to a cost-benefit analysis.

Table 10. Most Commonly Identified Future Risk Controls (Top Five)

Pos.	Future Controls	Count
1	3 Communications - one point of contact for Oban Bay and its Approaches.	41
2	9 Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity.	41
3	3 Communications - website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points.	40
4	3 Communications - traffic broadcast dedicated VHF channel for Oban Harbour.	39
5	39 Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches.	30
Note: The count identifies the number of times the control was identified in the NRA process		

From Table 10, a pattern of re-occurring themes are evident. A full list of Future Risk Controls is shown in Appendix C.

4. References

Department for Transport (DfT) 2012. "Port Marine Safety Code", December 2012

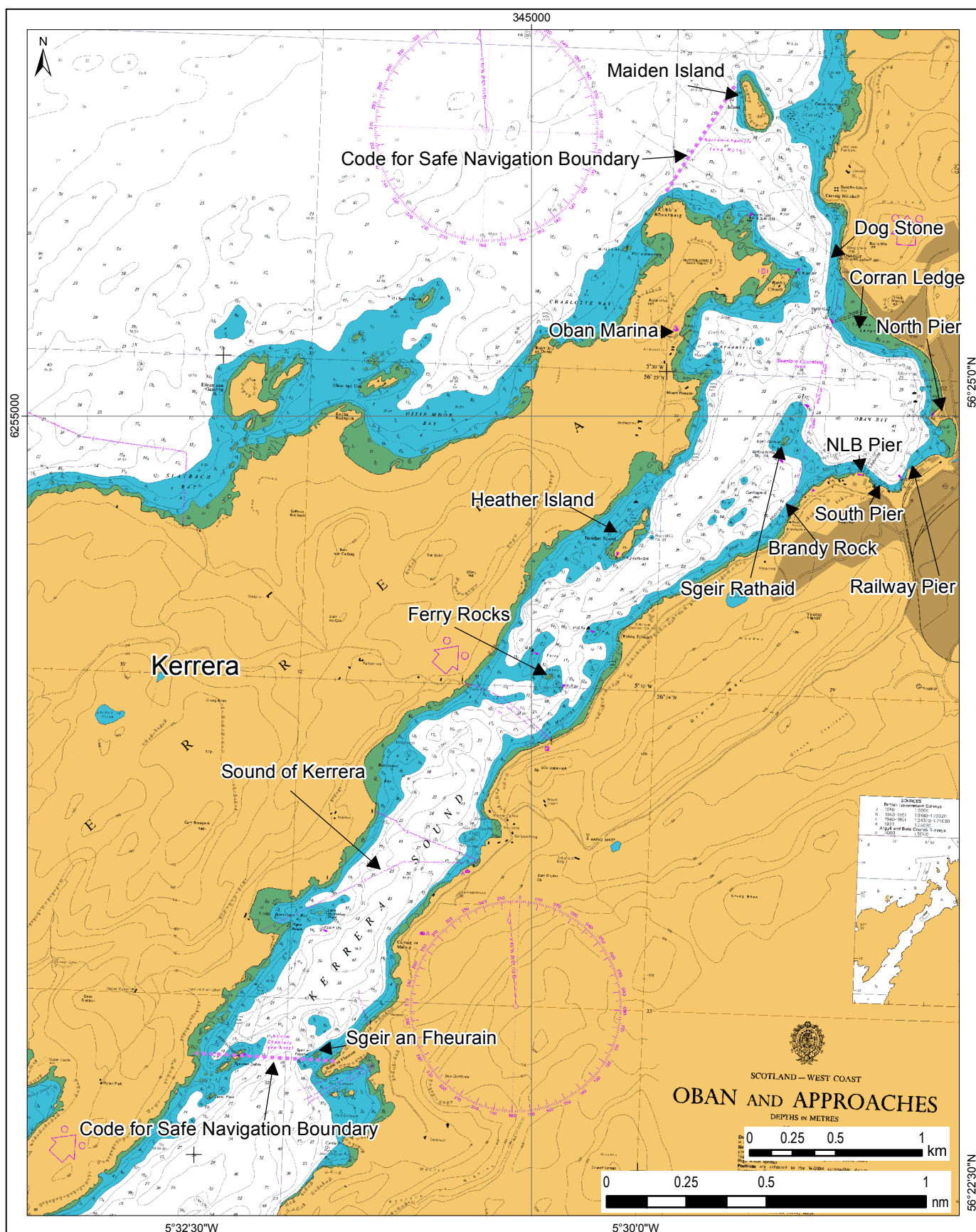
Department for Transport (DfT) 2013. "A Guide To Good Practice On Port Marine Operations - Prepared In Conjunction With The Port Marine Safety Code", July 2013

Fisher Associates, 2014. 'Development of Oban Bay Harbour Management Plan – Progress Report' 21 March 2014


Ofcom, 2014. 'Use of International Maritime VHF Channels'. Website accessed: 29 April 2014.
http://www.ofcom.org.uk/static/archive/ra/publication/ra_info/ra264/ra264.htm


Figures





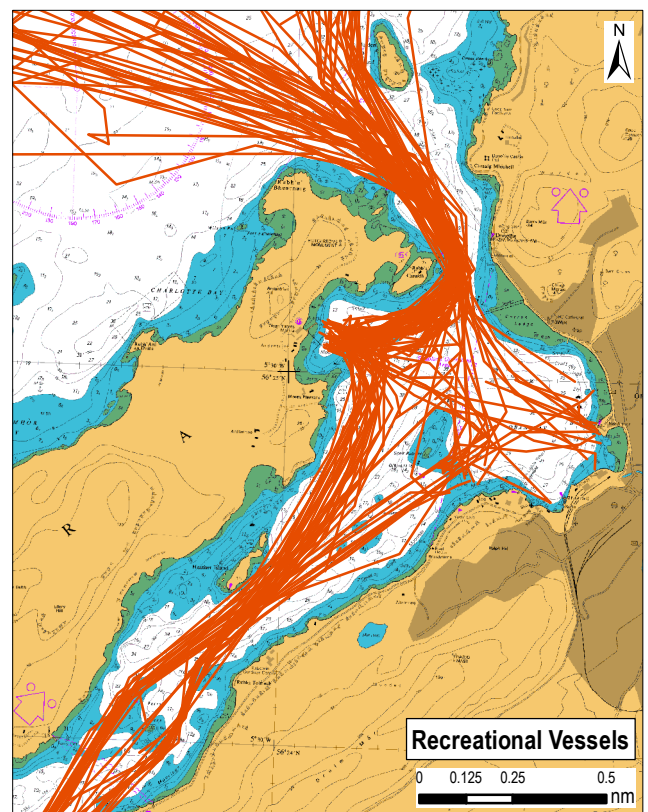
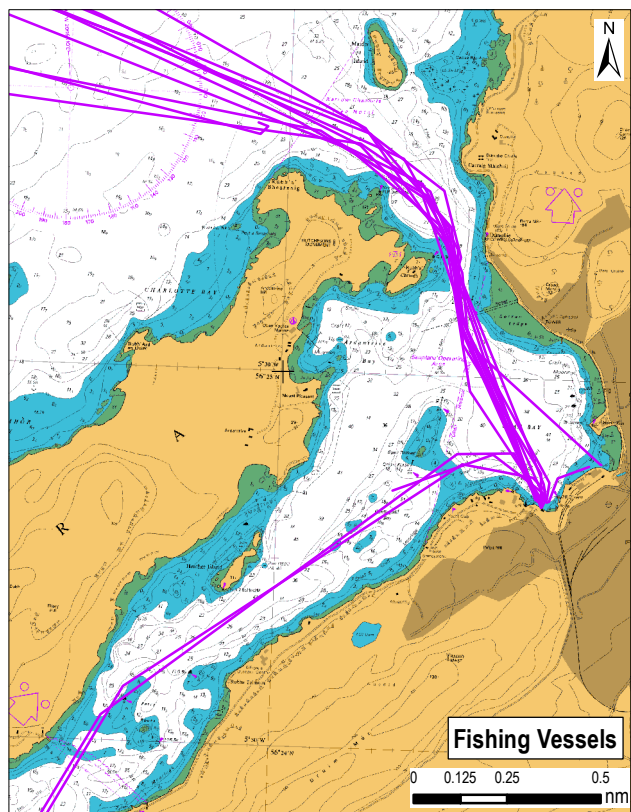
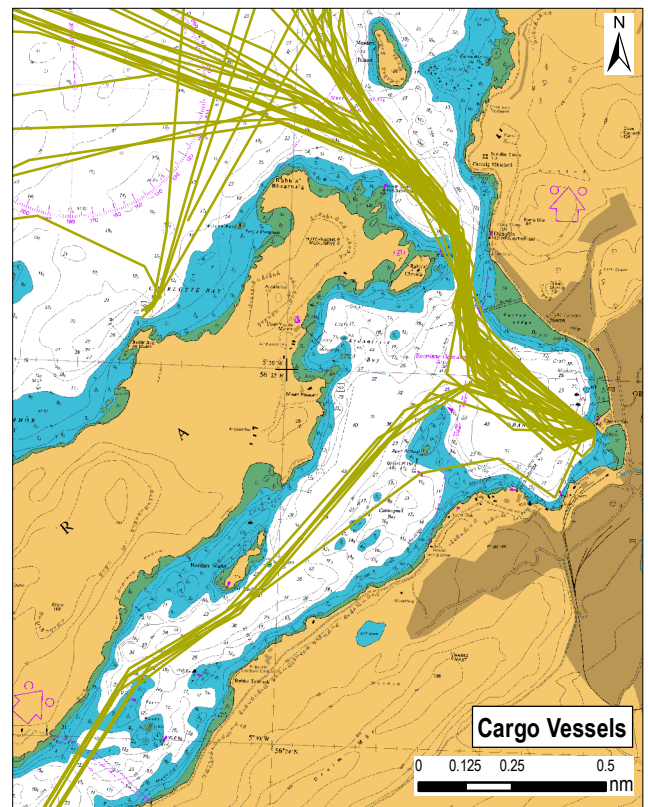
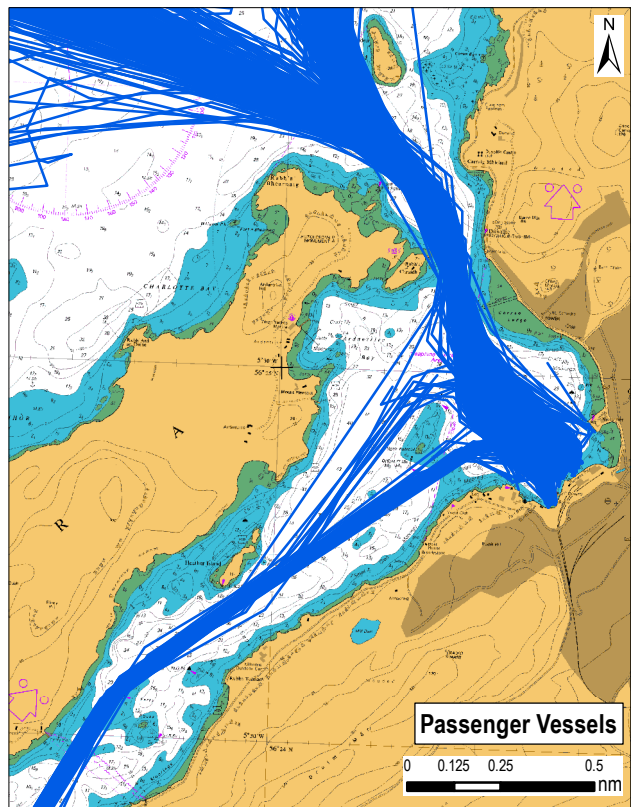
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marine environmental research



Study Area

Figure 1

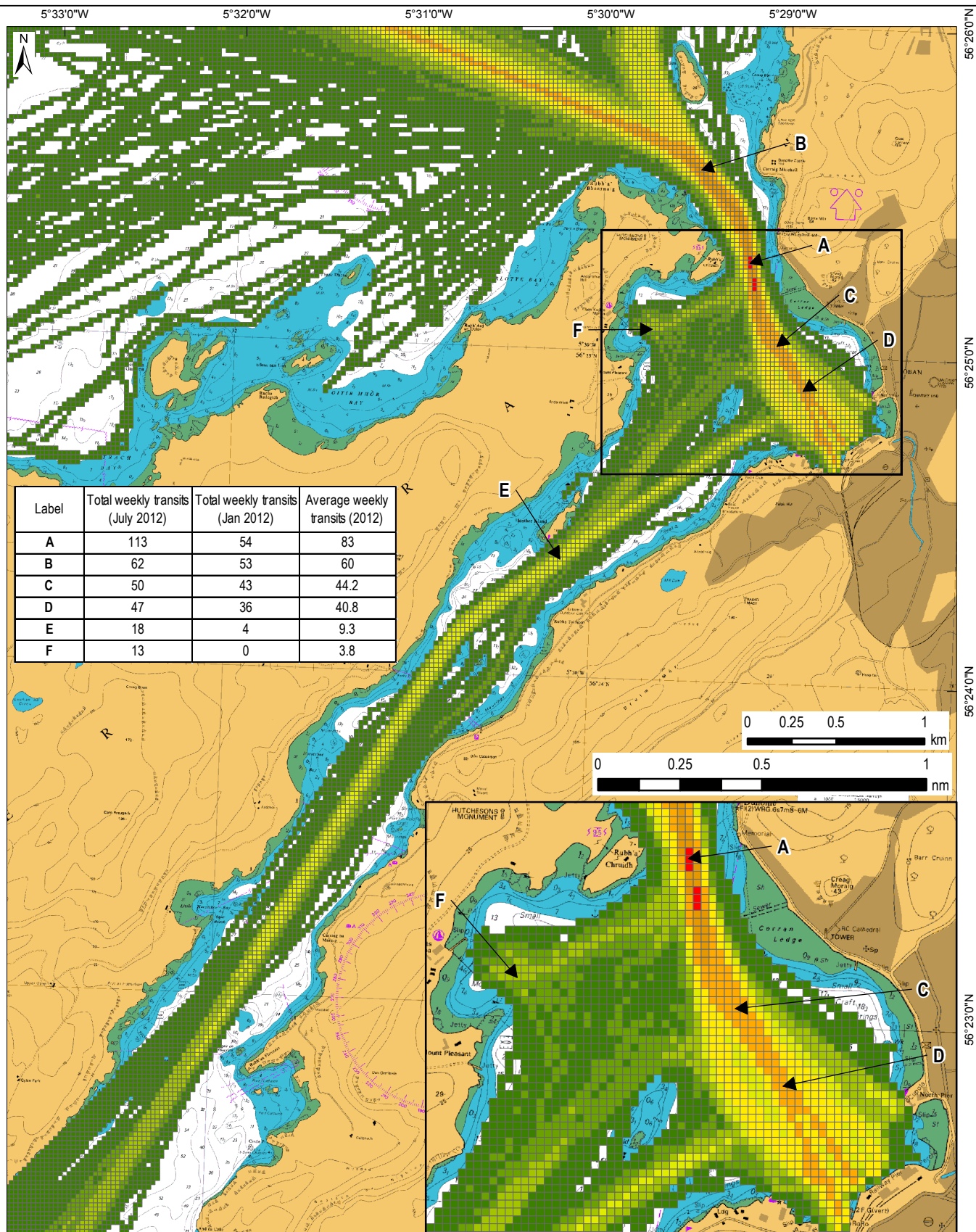


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- Passenger Vessels
- Cargo Vessels
- Fishing Vessels
- Recreational Vessels

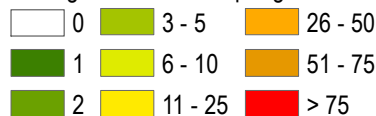
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Transit Lines created from 42 days of AIS-A and AIS-B data for 2012 from the first week of the following months: January, March, May, July, September and November 2012. AIS data supplied from the MCA's network of AIS receiving Stations.



Date	By	Size	Version
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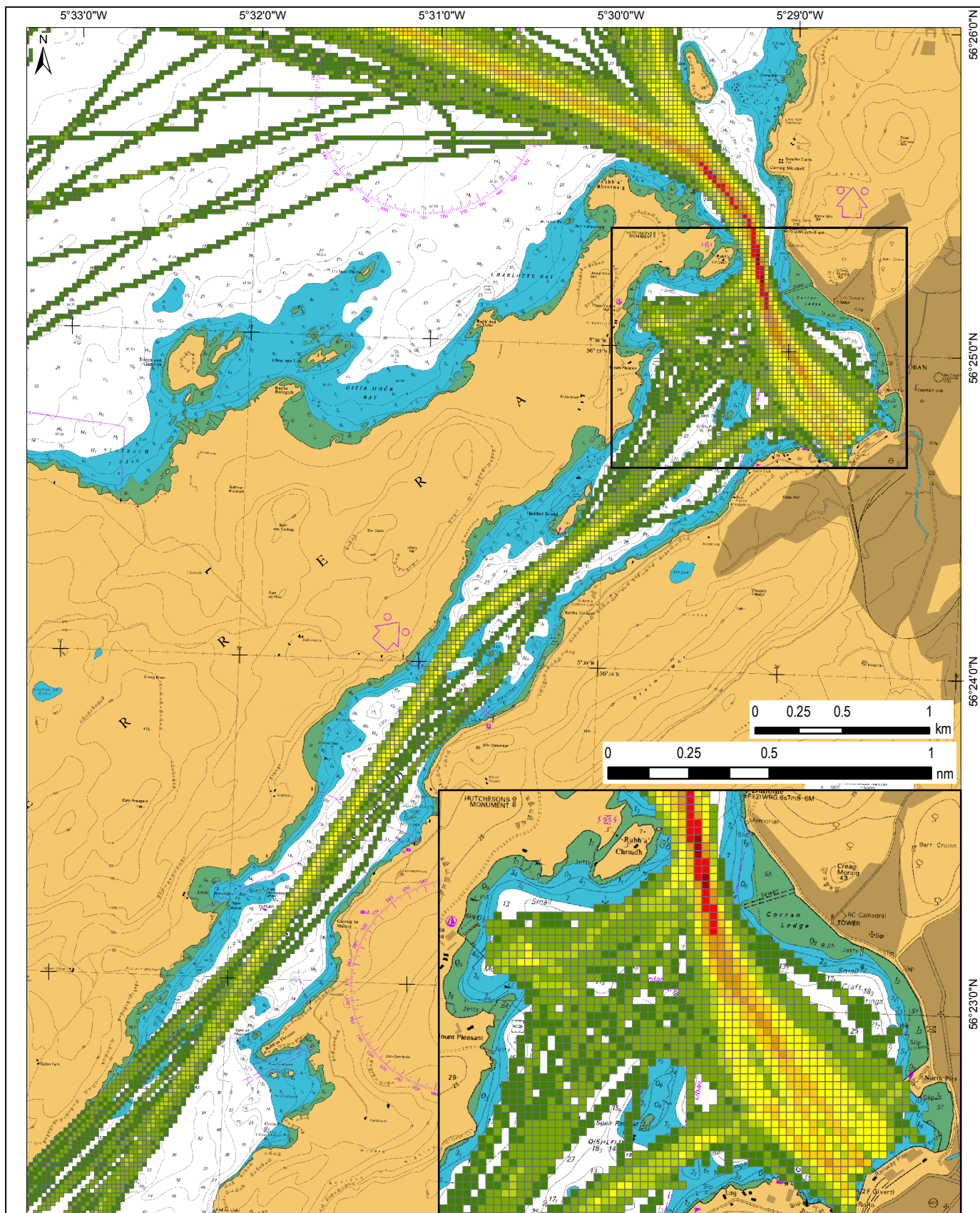
Average no. of transits per grid cell



Extent of inset map (scale 1:17,500)

25m density grid created from 42 days of AIS-A and AIS-B data for 2012 from the first week of the following months: January, March, May, July, September and November 2012. AIS data supplied from the MCA's network of AIS receiving Stations.

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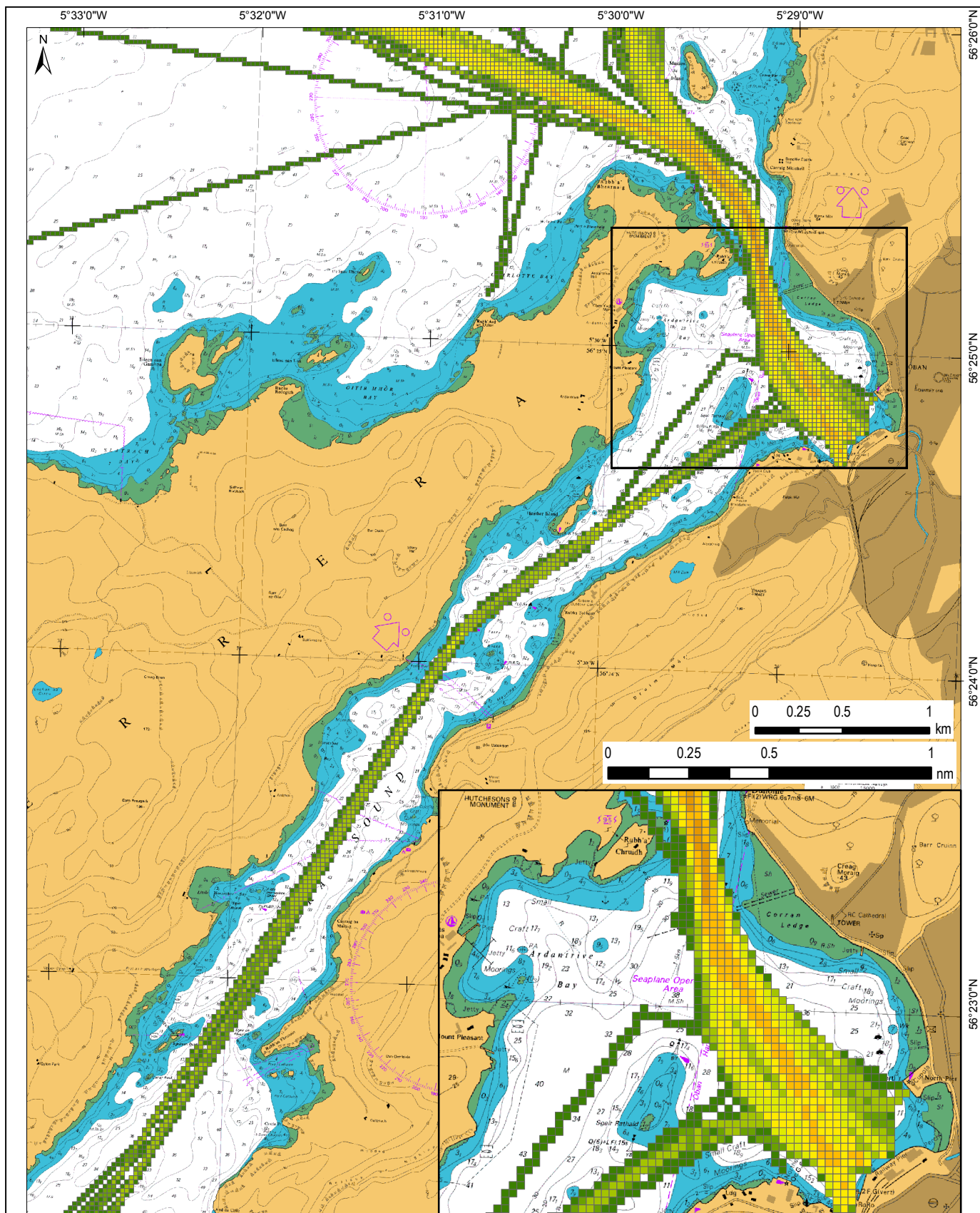


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QA		RTP	
4229_Fig4_July_2012_Density_Grid			
Produced by ABPmer			

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No. of transits per grid cell		
0	6 - 10	51 - 75
1	11 - 25	76 - 100
2 - 5	26 - 50	101 - 113
Extent of inset map (scale 1:17,500)		

25m density grid created from 7 days of AIS-A and AIS-B data from 1st to 7th July 2012. AIS data supplied from the MCA's network of AIS receiving Stations.



Date	By	Size	Version
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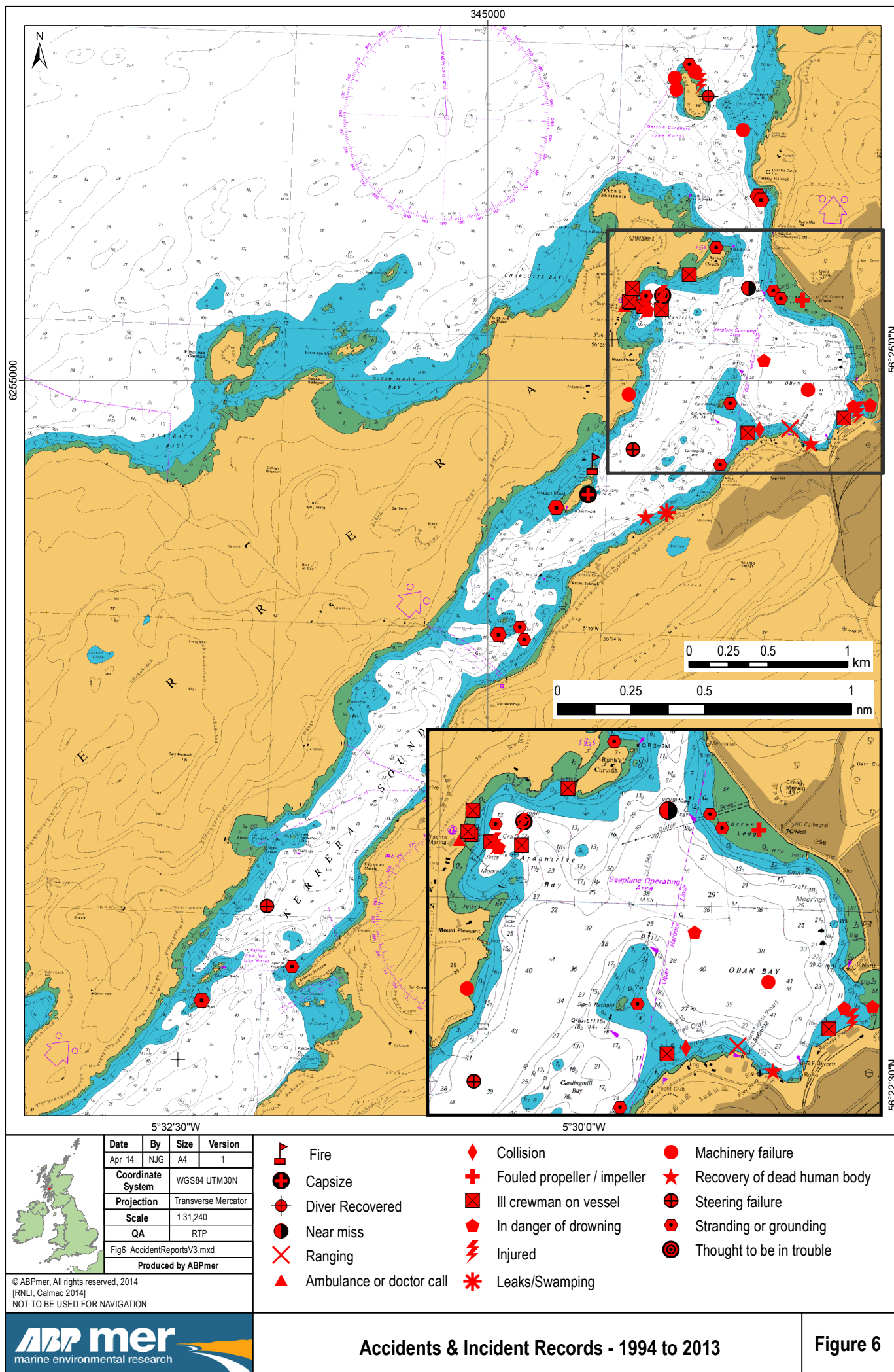
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No. of transits per grid cell	
 0	 6 - 10
 1	 11 - 25
 2	 26 - 50
 3 - 5	 51 - 75
 Extent of inset map (scale 1:17,500)	

25m density grid created from 7 days of AIS-A and AIS-B data from 3rd to 9th January 2012. AIS data supplied from the MCA's network of AIS receiving Stations.

Winter Weekly Vessel Density (January 2012)

Figure 5



Appendices



Appendix A

Accident and Incident Records - 1993 to 2013



A. Accident and Incident Records - 1993 to 2013

Incident Date	Vessel/Type	Incident Type	Visibility	Sea State	Location/Lat	Location/Long	Record Origin
04 January 1993	Fishing/Commercial	Hazardous Incident		Rough	56.38333333	-5.53333333	MAIB Database
30 March 1993	Fishing/Commercial	Machinery failure	Mod. 2 - 5 nm (3)		56.38333333	-5.53333333	MAIB Database
11 January 1994	Fishing/Commercial	Stranding or grounding	Good (5 - 10)	Calm <2 ft	56.41666667	-5.5	MAIB Database
28 July 1994	Leisure/Sailing	Stranding or grounding	-	-	Corran Ledge	-	Oban Lifeboat Station Records
07 October 1994	Fishing/Commercial	Machinery failure	Good (5 - 10)	Moderate	56.43333333	-5.5	MAIB Database
18 December 1994	Fishing/Commercial	Stranding or grounding	Good (5 - 10)	Rough	56.4	-5.5	MAIB Database
05 July 1995	Leisure/Motorboat	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
08 August 1995	Leisure/Sailing	Stranding or grounding	-	-	Corran Ledge	-	Oban Lifeboat Station Records
11 September 1995	Commercial/Other	Accident to person	Good (5 - 10)		56.41666667	-5.46666667	MAIB Database
02 December 1995	Fishing/Commercial	Leaks/Swamping		Calm <2 ft	56.41666667	-5.46666667	MAIB Database
08 December 1995	Fishing/Commercial	Stranding or grounding	Good (5 - 10)	Calm <2 ft	56.41666667	-5.48333333	MAIB Database
08 June 1996	Fishing/Commercial	Stranding or grounding	Good (5 - 10)	Calm <2 ft	56.43333333	-5.48333333	MAIB Database
30 July 1996	Fishing/Commercial	Machinery failure			56.43333333	-5.5	MAIB Database
09 August 1996	Leisure/Motorboat	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
14 August 1996	Commercial/Ferry	Accident to person	Good (5 - 10)	Calm <2 ft	56.41666667	-5.46666667	MAIB Database
06 November 1996	Fishing/Commercial & Fishing/Commercial	Stranding or grounding	Good (5 - 10)	Calm <2 ft	56.41666667	-5.46666667	MAIB Database
08 March 1997	Fishing/Commercial	Stranding or grounding	Good (5 - 10)	Calm <2 ft	56.41666667	-5.48333333	MAIB Database
28 May 1997	Fishing/Commercial	Machinery failure		Calm <2 ft	56.43333333	-5.5	MAIB Database
14 September 1997	Unknown	Adrift/Tow	-	-	-	-	Oban Lifeboat Station Records
11 January 1998	Leisure/Diving	Accident to person	-	-	Maiden Island		Oban Lifeboat Station Records
08 February 1998	Unknown	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
30 April 1998	Fishing/Commercial	Stranding or grounding	Poor <2 nm (1,2)	Calm <2 ft	56.38333333	-5.53333333	MAIB Database
07 July 1998	Leisure/Sailing	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
03 August 1998	Leisure/Sailing	Adrift/Tow	-	-	-	-	Oban Lifeboat Station Records
29 August 1998	Commercial/Ferry & Commercial/Other	Hazardous Incident	Good (5 - 10)		56.43333333	-5.5	MAIB Database
07 September 1998	Leisure/Sailing	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
16 September 1998	Leisure/Sailing	Adrift/Tow	-	-	-	-	Oban Lifeboat Station Records
29 October 1998	Commercial/Ferry	Accident to person			56.41666667	-5.46666667	MAIB Database
23 November 1998	Commercial/Cargo	Person Overboard			56.41666667	-5.48333333	MAIB Database
16 June 1999	Commercial/Other	Accident to person	Good (5 - 10)		56.41666667	-5.48333333	MAIB Database
19 June 1999	Leisure/Dinghy	Capsize	-	-	-	-	Oban Lifeboat Station Records
06 August 1999	Leisure	Hazardous Incident	Good (5 - 10)	Calm <2 ft	56.41666667	-5.48333333	MAIB Database
06 August 1999	Commercial/Ferry	Hazardous Incident	Good (5 - 10)	Calm <2 ft	56.41666667	-5.48333333	MAIB Database
08 August 1999	Commercial/Ferry	Machinery failure	Good (5 - 10)	Moderate	56.41666667	-5.53333333	MAIB Database
28 March 2000	Shore Facility (Pier)	Fire	-	-	-	-	Oban Lifeboat Station Records
12 August 2000	Commercial/Other	Accident to person	Good (5 - 10)		56.41666667	-5.46666667	MAIB Database
30 August 2000	Commercial/RIB	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
08 October 2000	Commercial/Cargo	Stranding or grounding	-	-	-	-	Oban Lifeboat Station Records
28 October 2000	Leisure/Divers	Diver Recovered	-	-	Maiden Island		Oban Lifeboat Station Records
20 February 2001	Commercial/Cargo	Accident to person		Calm <2 ft	56.41666667	-5.46666667	MAIB Database
03 March 2001	Unknown	Machinery failure	-	-	Maiden Island		Oban Lifeboat Station Records
13 April 2001	Leisure/Sailing	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
16 April 2001	Fishing/Commercial	Person Overboard	Good (5 - 10)		56.4	-5.46666667	MAIB Database
24 July 2001	Leisure/Sailing	Stranding or grounding	-	-	Oban Bay	-	Oban Lifeboat Station Records
20 August 2001	Commercial/Other	Impact with structure	Good (5 - 10)		56.41666667	-5.46666667	MAIB Database
06 October 2001	Unknown	Machinery failure	-	-	-	-	Oban Lifeboat Station Records
04 February 2002	Fishing/Commercial	Fouled propeller / impeller	-	-	-	-	Oban Lifeboat Station Records
08 June 2002	Commercial/Divers	Injury/Hit by Prop	-	-	-	-	Oban Lifeboat Station Records
17 July 2002	Leisure/Sailing	Stranding or grounding	-	-	Sound of Kerrera		Oban Lifeboat Station Records
17 July 2002	Fishing/Commercial	Machinery failure	-	-	Sound of Kerrera		Oban Lifeboat Station Records
14 August 2002	Commercial/Ferry/Leisure	Near miss (collision)	-	-	Oban Bay		CalMac

Incident Date	Vessel/Type	Incident Type	Visibility	Sea State	Location/Lat	Location/Long	Record Origin
27 August 2002	Commercial/Other & Commercial/Ferry	Collision	Mod. 2 - 5 nm (3)	Calm <2 ft	56.41666667	-5.483333333	MAIB Database
10 January 2003	Commercial/Ferry	Fire	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
10 April 2003	Commercial/Ferry	Accident to person	Good (5 - 10)		56.41666667	-5.466666667	MAIB Database
11 April 2003	Fishing/Commercial	Stranding or grounding	-	-	Cutter Rock		Oban Lifeboat Station Records
04 June 2003	Leisure & Fishing/Commercial	Collision	Good (5 - 10)	Calm <2 ft	56.40333333	-5.503333333	MAIB Database
13 July 2003	Leisure/Dinghy	Capsize	-	-	Heather Island		Oban Lifeboat Station Records
20 October 2003	Commercial/Other	Accident to person			56.41666667	-5.466666667	MAIB Database
30 May 2004	Commercial/Ferry & Leisure	Near miss (collision)	Good (5 - 10)	Unknown	56.41666667	-5.466666667	MAIB Database
15 August 2004	Commercial/Other	Machinery failure			56.75	-6.216666667	MAIB Database
29 August 2004	Commercial/Ferry	Machinery failure	Good (5 - 10)	Unknown	56.41666667	-5.466666667	MAIB Database
17 December 2004	Commercial/Ferry	Impact with structure	Unknown	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
29 December 2004	Commercial/Ferry & Commercial/Ferry	Impact with structure	Poor <2 nm (1,2)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
19 January 2005	Commercial/Workboat	Stranding or grounding	-	-	Oban Esplanade		Oban Lifeboat Station Records
30 April 2005	Commercial/Other	Person Overboard	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
18 May 2005	Leisure/Sailing	Machinery failure	-	-	Maiden Island		Oban Lifeboat Station Records
07 July 2005	Leisure/Sailing	Machinery failure	-	-	Sound of Kerrera		Oban Lifeboat Station Records
19 July 2005	Commercial/Ferry	Stranding or grounding			56.4	-5.5	MAIB Database
23 September 2005	Unknown	Fire	-	-	Heather Island		Oban Lifeboat Station Records
22 January 2006	Commercial/Other	Accident to person	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
21 April 2006	Fishing/Commercial	Hazardous Incident	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
14 May 2006	Commercial/Ferry	Accident to person	Good (5 - 10)	Sheltered Waters	56.41166667	-5.476666667	MAIB Database
02 June 2006	Commercial/Ferry	Accident to person	Good (5 - 10)	Calm <2 ft	56.41666667	-5.466666667	MAIB Database
20 June 2006	Commercial/Other	Machinery failure	Mod. 2 - 5 nm (3)	Moderate	56.42666667	-5.49	MAIB Database
06 August 2006	Unknown	Stranding or grounding	-	-	Heather Island		Oban Lifeboat Station Records
16 August 2006	Commercial/Ferry	Accident to person	Unknown	Unknown	56.41666667	-5.466666667	MAIB Database
30 August 2006	Commercial/Ferry	Accident to person	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
07 October 2006	Commercial/Ferry	Machinery failure	Mod. 2 - 5 nm (3)	Unknown	56.41666667	-5.466666667	MAIB Database
10 November 2006	Fishing/Commercial	Pollution	Unknown	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
27 February 2007	Unknown	Stranding or grounding	-	-	56.42179355	-5.488212739	MCA
03 June 2007	Fishing/Commercial	Machinery failure	-	-	Maiden Island		Oban Lifeboat Station Records
28 July 2007	Commercial/Ferry	Accident to person	Good (5 - 10)		56.43333333	-5.466666667	MAIB Database
01 August 2007	Unknown	Stranding or grounding	-	-	56.41791478	-5.48099609	MCA
30 August 2007	Leisure/Sailing	Stranding or grounding	-	-	Oban Bay		Oban Lifeboat Station Records
09 September 2007	Leisure/Dinghy	Capsize	-	-	-	-	Oban Lifeboat Station Records
19 May 2008	Commercial/Ferry	Accident to person	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
28 March 2009	Commercial/Ferry	Stranding or grounding	GOOD	SLIGHT	56.410400	-5.491300	CalMac
30 April 2009	Fishing/Leisure	Machinery failure	EXCELLENT	SLIGHT	56.379800	-5.600200	RNLI Central Database
07 May 2009	Unknown	Stranding or grounding	-	-	56.40925655	-5.488361648	MCA
12 July 2009	Unknown	Stranding or grounding	-	-	56.39986526	-5.511139974	MCA
27 August 2009	Commercial/Ferry	Accident to person	Good (5 - 10)	Calm <2 ft	56.72333333	-5.39	MAIB Database
21 September 2009	Leisure/Sailing	Stranding or grounding	GOOD	SLIGHT	56.418500	-5.478600	RNLI Central Database
14 February 2010	Person	Person in distress	GOOD	SMOOTH	56.435000	-5.480100	RNLI Central Database
28 March 2010	Person	Recovery of dead human body	GOOD	CALM	56.411200	-5.479200	RNLI Central Database
31 March 2010	Fishing/Commercial	Stranding or grounding	FAIR	SMOOTH	56.422100	-5.489600	RNLI Central Database
01 April 2010	Fishing/Commercial	Stranding or grounding	FAIR	SMOOTH	56.422100	-5.489600	RNLI Central Database
16 April 2010	Leisure/Sailing	Machinery failure	EXCELLENT	SMOOTH	56.428800	-5.487300	RNLI Central Database
03 June 2010	Person	Ambulance or doctor call	EXCELLENT	CALM	56.418600	-5.498800	RNLI Central Database
04 June 2010	Fishing/Commercial	Ill crewman on vessel	GOOD	GLASS CALM	56.412700	-5.475900	RNLI Central Database
04 July 2010	Leisure/Sailing	Ill crewman on vessel	GOOD	SMOOTH	56.418500	-5.495000	RNLI Central Database
29 July 2010	Leisure/Sailing	Stranding or grounding	-	-	Ferry Rocks, Sound of Kerrera		Oban Lifeboat Station Records
29 July 2010	Leisure	Ill crewman on vessel	EXCELLENT	GLASS CALM	56.418800	-5.498100	RNLI Central Database
04 August 2010	Commercial/Other	Accident to person	Good (5 - 10)	Moderate	56.41	-5.478333333	MAIB Database
10 August 2010	Leisure	Thought to be in trouble	GOOD	SLIGHT	56.419300	-5.494900	RNLI Central Database
31 August 2010	Leisure	Ill crewman on vessel	GOOD	CALM	56.418900	-5.498300	RNLI Central Database
06 September 2010	Leisure & Fishing/Commercial	Collision	Poor <2 nm (1,2)	Moderate	56.41666667	-5.466666667	MAIB Database

Incident Date	Vessel/Type	Incident Type	Visibility	Sea State	Location/Lat	Location/Long	Record Origin
30 September 2010	Fishing/Commercial	Stranding or grounding	GOOD	CALM	56.370300	-5.532700	RNLI Central Database
03 October 2010	Leisure/Diving	Machinery failure	FAIR	SMOOTH	56.383300	-5.597100	RNLI Central Database
11 November 2010	Leisure	Steering failure	FAIR	CHOPPY	56.410500	-5.497400	RNLI Central Database
17 November 2010	Fishing/Leisure	In danger of drowning	FAIR	SLIGHT	56.392100	-5.515900	RNLI Central Database
10 December 2010	Fishing/Commercial	Fouled propeller / impeller	GOOD	SMOOTH	56.419300	-5.480600	RNLI Central Database
17 February 2011	Commercial/Ferry	Pollution	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
18 February 2011	Commercial/Ferry	Hazardous Incident	Good (5 - 10)	Sheltered Waters	56.41666667	-5.466666667	MAIB Database
16 April 2011	Leisure/Sailing	Machinery failure	GOOD	CALM	56.413600	-5.498000	RNLI Central Database
30 April 2011	Leisure	Ill crewman on vessel	EXCELLENT	SMOOTH	56.418600	-5.496900	RNLI Central Database
23 May 2011	Unknown	Stranding or grounding	-	-	56.41850461	-5.497724917	MCA
18 July 2011	Fishing/Commercial	Stranding or grounding	GOOD	CALM	56.413300	-5.487600	RNLI Central Database
06 August 2011	Leisure/Sailing	Ill crewman on vessel	FAIR	CALM	56.419000	-5.496600	RNLI Central Database
28 August 2011	Leisure/Sailing	Ill crewman on vessel	GOOD	SMOOTH	56.411800	-5.484500	RNLI Central Database
04 September 2011	Person/Swimming	In danger of drowning	GOOD	CALM	56.413500	-5.473300	RNLI Central Database
12 September 2011	Unknown	Stranding or grounding	-	-	56.40923833	-5.48900865	MCA
03 October 2011	Leisure/Sailing	Machinery failure	-	-	Oban Bay		Oban Lifeboat Station Records
28 November 2011	Commercial/cargo & Commercial/Ferry	Near miss (collision)	-	-	Oban Bay Northerly Entrance		NLB
10 December 2011	Commercial/Ferry	Accident to person	Good (5 - 10)	Calm <2 ft	56.41166667	-5.475	MAIB Database
03 January 2012	Fishing/Commercial	Leaks/Swamping	GOOD	SLIGHT	56.407000	-5.493700	RNLI Central Database
15 February 2012	Leisure	Machinery failure	GOOD	CHOPPY	56.414200	-5.479700	RNLI Central Database
18 February 2012	Unknown	Collision	-	-	56.41193202	-5.476978533	MCA
10 April 2012	Person	Recovery of dead human body	GOOD	CALM	56.406700	-5.495800	RNLI Central Database
24 May 2012	Person/Swimming	In danger of drowning	EXCELLENT	GLASS CALM	56.415800	-5.484300	RNLI Central Database
02 June 2012	Leisure/Sailing	Stranding or grounding	GOOD	CALM	56.399500	-5.507800	RNLI Central Database
30 June 2012	Fishing/Commercial	Accident to person	GOOD	GLASS CALM	56.413000	-5.474500	RNLI Central Database
21 July 2012	Leisure/Sailing	Dragged Anchor	-	-	Oban Bay		Oban Lifeboat Station Records
22 July 2012	Leisure	Stranding or grounding	GOOD	SMOOTH	56.419000	-5.478300	RNLI Central Database
15 August 2012	Leisure/Sailing	In danger of drowning	GOOD	SMOOTH	56.418400	-5.496400	RNLI Central Database
23 August 2012	Leisure	Accident to person	GOOD	CALM	56.418500	-5.496600	RNLI Central Database
03 September 2012	Person/Swimming	In danger of drowning	GOOD	CALM	56.413400	-5.475000	RNLI Central Database
28 February 2013	Fishing/Leisure	Ill crewman on vessel	GOOD	CALM	56.420500	-5.492300	RNLI Central Database
22 March 2013	Commercial/Cargo	Ranging	-	-	NLB Berth		NLB
19 April 2013	Fishing/Commercial	Steering failure	EXCELLENT	SLIGHT	56.383300	-5.566700	RNLI Central Database
20 May 2013	Commercial/Cruise	Stranding or grounding	GOOD	SLIGHT	56.419000	-5.496600	RNLI Central Database
09 July 2013	Leisure/Dinghy	Adrift/Tow	-	-	Cardingmill Bay		Oban Lifeboat Station Records
12 July 2013	Leisure/Motorboat	Stranding or grounding	GOOD	SMOOTH	56.380500	-5.530300	RNLI Central Database
13 July 2013	Leisure	Accident to person	GOOD	SMOOTH	56.419200	-5.495000	RNLI Central Database
15 September 2013	Leisure/Sailing	Stranding or grounding	GOOD	CHOPPY	56.431800	-5.479300	RNLI Central Database

Appendix B

Navigational Risk Assessments



Hazard Category	Hazard Description	Worst Credible	Freq.	Worst Credible				Most likely	Freq.	Most likely				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
			(yrs)	People	Property	Planet	Port		(yrs)	People	Property	Planet	Port				
Grounding 1	Recreation/Fishing vessel grounds on a drying area within The Sound of Kerrera, including Ferry Rocks, Heather Island and 'Sgeir an Fheurain'.	Vessel is holed and takes on water. Several crew members have serious injuries. Fuel oil leaks from ruptured fuel tanks. All traffic movement through The Sound of Kerrera suspended by a Temporary Exclusion Zone. Adverse publicity.	50	4	4	4	3	Vessel has minor damage and is able to make its way to a berth without outside assistance. Damage to the keel requiring lifting/drying, inspection and minor repairs. Minor injury to crew. No pollution. The Sound of Kerrera remains open to traffic.	1	6	6	0	6	4.56	10 - Passage planning – carried out by Master of vessel. 36 - Availability of pollution response equipment. 57 - Aids to navigation, provision & maintenance – buoyage. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix. 57 - Aids to navigation, provision & maintenance – review of Aid to Navigation in the Sound of Kerrera to consider alternatives to existing pattern at Ferry Rocks.	
Grounding 2	Large Vessel (ferry/cruise/cargo) runs aground on a drying area in The Sound of Kerrera, including Ferry Rocks, Heather Island and 'Sgeir an Fheurain'.	Bow is holed and vessel takes on water. Fuel leaks from forward tanks. Weather is deteriorating and vessel is being driven further onto the rocks. Crew and passengers have serious injuries. Rescue operation coordinated by HM Coastguards including a request for tug assistance. All traffic movement through The Sound of Kerrera suspended by a Temporary Exclusion Zone. Adverse publicity.	50	4	5	4	4	Vessel's bow is damaged but watertight integrity is not compromised. Potential for pollution. Potential for multiple minor injuries, or single major injury (i.e. broken leg). Vessel uses own engines to clear the rocks and proceeds to berth for diver inspection of damage. The Sound of Kerrera remains open to traffic. Media interest leading to adverse publicity.	5	6	6	3	6	5.13	10 - Passage planning – carried out by Master of vessel. 36 - Availability of pollution response equipment. 57 - Aids to navigation, provision & maintenance – buoyage. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 24 - Contingency plan exercises - exercise for Harbour personnel. 36 - Availability of pollution response equipment. 57 - Aids to navigation, provision & maintenance – buoyage. 57 - Aids to navigation, provision & maintenance – Sector lights. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix. 57 - Aids to navigation, provision & maintenance – review of Aid to Navigation in the Sound of Kerrera to consider alternatives to existing pattern at Ferry Rocks.	Grounding of the ferry 'Isle of Arran' on 'Sgeir Rathaid', plus two further records of large vessel groundings.
Grounding 3	Recreation/Fishing vessel grounds on a drying area in the northern approaches, or Oban Bay, including 'Sgeir Rathaid' and Corran Ledge.	Bow is holed and vessel takes on water. Fuel leaks from forward tanks. Several crew members have serious injuries. Traffic continues, passing the grounded vessel with care. Adverse publicity.	50	4	5	4	4	The vessel has minor damage and is able to make its way to a berth without outside assistance. Damage to the keel requiring lifting/drying, inspection and minor repairs. No injury to crew. No pollution. Northern Approaches traffic unaffected.	1	0	7	0	8	5.25	10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 24 - Contingency plan exercises - exercise for Harbour personnel. 36 - Availability of pollution response equipment. 57 - Aids to navigation, provision & maintenance – buoyage. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix.	This RA also includes cruise ship tenders entering the North Channel transiting across the Corran Ledge. Anecdotal information from Harbour Stakeholders suggests that on occasion, cruise tenders touch the bottom but have never been stranded. It is speculated the cause is inadequate briefing given to tender skippers, or a misunderstanding of the tides and charts.
Grounding 4	Large vessel (i.e. ferry/cruise/cargo) grounds on a drying area in the northern approaches, including Corran Ledge.	Bow is holed and vessel takes on water. Fuel leaks from forward tanks. Weather is deteriorating and vessel is being driven further ashore. Crew and passengers have serious injuries. Rescue operation coordinated by Coastguards including a request for tug assistance. All traffic movement through the northern approaches suspended by a Temporary Exclusion Zone. Adverse publicity.	50	4	5	4	4	Vessel's bow is damaged but watertight integrity is not compromised. Vessel uses own engines to clear the rocks and proceeds on passage. No pollution. No injuries. No effect on marine traffic movements. Media interest leading to adverse publicity.	10	0	6	0	6	4.56	10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 24 - Contingency plan exercises - exercise for Harbour personnel. 36 - Availability of pollution response equipment. 57 - Aids to navigation, provision & maintenance – buoyage. 57 - Aids to navigation, provision & maintenance – Sector lights. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix.	Grounding of the Cruise vessel 'Serenisima'. The NLB has reviewed the buoyage situation in the approaches to Oban Bay, including the West Cardinal mark at the extremity of Corran Ledge, this included a consultation process with harbour users. The conclusion of the NLB review identified that the current buoyage arrangement was the most appropriate.
Grounding 5	Large vessel (i.e. ferry/cruise/cargo) grounds on a drying area in Oban Bay, including 'Sgeir Rathaid'.	Bow is holed and vessel takes on water. Fuel oil leaks from forward fuel tanks. Weather is deteriorating and vessel is being driven further ashore. Crew and passengers have serious injuries. Rescue operation coordinated by Coastguards including a request for tug assistance. All traffic movement through Oban Bay is suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	4	5	4	4	Vessel's bow is damaged but watertight integrity is not compromised. Vessel uses own engines to clear the rocks and proceeds on passage. No pollution. No injuries. No effect to Oban Bay vessel traffic. Media interest leading to adverse publicity.	5	6	6	3	6	5.13	10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 24 - Contingency plan exercises - exercise for Harbour personnel. 36 - Availability of pollution response equipment. 57 - Aids to navigation, provision & maintenance – buoyage. 57 - Aids to navigation, provision & maintenance – Sector lights. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix. 57 - Aids to navigation, provision & maintenance – review of Aid to Navigation in the Sound of Kerrera to consider alternatives to existing pattern at Ferry Rocks.	Grounding of the ferry 'Isle of Arran' on 'Sgeir Rathaid', plus two further records of large vessel groundings.

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible					Most likely	Freq. (yrs)	Most likely					Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Collision 1	Large vessel (i.e. cargo) collides with another large vessel (i.e. ferry/cruise) in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	Both vessels have significant hull damage and start to take on water. Fuel leaks from fuel tanks on both vessels. Several crew members on both vessels, plus passengers have serious injuries. One vessel grounds and one vessel sinks within the main fairway. Rescue operation coordinated by Coastguards including a request for tug assistance. All traffic movement in the area suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	4	5	5	4		Both vessels incur damage to shell plating but watertight integrity is not compromised. Multiple minor injuries, or single major injury to crew and passengers. For ferry scenario, vehicles on the car deck break free during the collision and damage other vehicles. Multiple minor injuries, or single major injury crews and to passengers on the ferry. Possible minor pollution. No effect on marine traffic movements. Media interest leading to adverse publicity.	5	6	7	3	6		5.50	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 106 - Moving exclusion zone - around large vessel when exiting/entering Oban Bay. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	Frequency for 'Most Likely' scenario includes near misses recorded as 'near miss (collision)' involving large vessels over the 20 year dataset.
Collision 2	Small craft (yacht/RIB/Powerboat/kayak) collides with a large vessel (i.e. ferry/cruise/cargo) in The Sound of Kerrera.	Small craft is struck amidships by the bow of the large vessel and immediately sinks. No damage to large vessel. At least one fatality on-board the yacht/RIB/Powerboat/kayak. Small scale pollution from small craft's fuel tanks. Traffic movements continue, rescue services in attendance. Media interest leading to adverse publicity.	50	5	3	1	3		Small craft's hull is damaged but watertight integrity is not compromised. Small craft can return to port to make repairs. Large vessel is undamaged. Minor injuries to small craft's crew. No pollution. No effect on marine traffic movements. Media interest.	25	3	2	0	2		3.19	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 45 - Guidance for small craft – appropriate information available in yachting/nautical publications. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone - around large vessel when exiting/entering Oban Bay. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	
Collision 3	Small craft (yacht/RIB/Powerboat/kayak) collides with a large vessel (i.e. ferry/cruise/cargo) in the northerly approaches to Oban Bay or within Oban Bay.	Small craft is struck amidships by the bow of the large vessel and immediately sinks. No damage to large vessel. At least one fatality on-board the yacht/RIB/Powerboat/kayak. Small scale pollution from small craft's fuel tanks. All traffic movement through the northern approaches is suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	3	1	3		Small craft's hull is damaged but watertight integrity is not compromised. Small craft can return to port to make repairs. Large vessel is undamaged. Minor injuries to small craft's crew. No pollution. No effect on marine traffic movements. Media interest leading to adverse publicity.	10	2	4	0	2		3.50	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 45 - Guidance for small craft – appropriate information available in yachting/nautical publications. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 98 - De-conflicting vessel interaction - small craft channel Western side of harbour entrance. 99 - No sailing zone - seasonal use to reduce potential for collision, exemptions applied for organised racing. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone - around large vessel when exiting/entering Oban Bay. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible People Propert Planet Port				Most likely	Freq. (yrs)	Most likely People Propert Planet Port				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Collision 4	Small craft (yacht/RIB/Powerboat) collides with a large floating object or navigation buoy in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	Small craft incurs significant hull damage and quickly sinks with loss of crew. Navigation buoy receives slight damage. Pollution from ruptured fuel tanks on-board the small craft. Media interest leading to adverse publicity.	50	5	4	3	3	Small craft incurs slight damage but remains afloat. Navigation buoy undamaged. Minor injuries to small craft crew. Media interest.	5	6	3	0	3	4.44	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 45 - Guidance for small craft – appropriate information available in yachting/nautical publications. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	
Collision 5	North bound yacht fleet (racing) in collision with a large south bound vessel (i.e. ferry/cruise/cargo) in the northern approaches to Oban Bay.	Yacht fleet, tacking into the wind racing out of Oban Bay meet with an incoming large vessel leading to collision with at least one of the racing fleet. Small craft is struck amidships by the bow of the large vessel and immediately sinks. No damage to large vessel. At least one fatality on-board the yacht. Small scale pollution from small craft's fuel tanks. All traffic movement into Oban Bay from the north suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	3	1	3	Yacht fleet, tacking into the wind racing out of Oban Bay meet an incoming large vessel leading to emergency avoidance by members of the sailing fleet, with glancing blows between sailing vessels. Small craft hull is damaged but watertight integrity is not compromised. Small craft can return to port to make repairs. Minor injuries to small craft's crew. No pollution. No effect on marine traffic movements. Media interest.	10	4	2	0	2	3.50	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 45 - Guidance for small craft – appropriate information available in yachting/nautical publications. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 99 - No sailing zone - seasonal use to reduce potential for collision, exemptions applied for organised racing. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators. 106 - Moving exclusion zone - around large vessel when exiting/entering Oban Bay. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	
Collision 6	Tendering operation from anchored cruise vessel to shore disembarkation location, leading to increased collision/sinking potential.	Tender, with maximum number of passengers on-board, in collision with another tender/other vessel, then sinks. Crew and passengers enter the water. Fatalities, traffic movements in the incident area suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	3	3	4	Tender in collision with another tender/other vessel, with maximum number of passengers on-board, takes on water on passage from a cruise vessel to the port. Crew and passengers slight injuries, transferred to another tender. Original tender recovered and lifted aboard the cruise vessel for inspection. No pollution. Media attention.	25	2	0	0	2	2.94	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 45 - Guidance for small craft – appropriate information available in yachting/nautical publications. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 98 - De-conflicting vessel interaction - small craft channel Western side of harbour entrance. 98 - De-conflicting vessel interaction – review of anchorage points for cruise vessels. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators. 106 - Moving exclusion zone - around large vessel when exiting/entering Oban Bay. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible					Most likely	Freq. (yrs)	Most likely					Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Collision 7	Fast craft (i.e. RIB, Dory, Speedboat, Personal Water Craft) in collision with a small low profile craft (i.e. kayak, canoe, small tender, inflatable) at speed.	Fast craft travelling at speed in moderate sea conditions giving rise to waves which obscure low profile (small) craft. High speed collision, causing serious injuries to crew and passengers on both vessels, at least one vessel severely damaged and sinks, no effect on marine traffic or pollution.	50	4	1	1	0		Fast craft travelling at speed in moderate sea conditions giving rise to waves which obscure low profile (small) craft. High speed collision, causing minor injuries to crew and passengers on both vessels, damage to one or both vessels, no effect on marine traffic or pollution.	25	2	2	0	0		2.13	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 7 - Pilotage service. 8 - PECs, authorisation and control of. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 41 - Notices to mariners - issued to manage vessels activity and behaviour within the harbour. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 45 - Guidance for small craft – appropriate information available in yachting/nautical publications. 70 - Marine Safety Management System - develop to include wider harbour area. 95 - Harbour standing orders – developed from Risk Assessment approach. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	
Impact with infrastructure	Large vessel (i.e. ferry, cruise, cargo, large fishing) impacts heavily with quay during berthing.	Vessel hull is damaged and fuel tank ruptured, causing pollution in Oban Bay. Several passengers on-board the ferry receive serious injuries. Vehicles on the car deck break loose and damage other vehicles. Quay structure damaged in impact. Shipping operations from the berth are suspended. Significant disruption to business operations. Media interest leading to adverse publicity.	50	3	4	4	4		Ferry is damaged but watertight integrity is not compromised. Minor damage to shore facilities. Vessel berths to assess damage. Possible minor injury to crew and passengers. No injuries ashore. No pollution. Media interest.	1	8	6	0	6		5.19	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 107 - Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	Anecdotal information plus incident records and information from berth damage expenditure used to arrive at the most likely scenario frequency.
Sinking/capsize 1	Large vessel (i.e. ferry/cruise/cargo) has sudden ingress of water whilst alongside a quay, jetty or pier.	Commercial craft (i.e. ferry/cruise/cargo) has ingress of water due to vessel defect or failure to follow operating procedures. Loss of life, pollution, significant property damage, if on linksan berth significant port suspension. Media interest leading to adverse publicity. Significant impact upon local commerce.	50	5	5	4	4		Commercial vessel taking on water, or listing due to ingress of water. Unlikely that injury to people will occur, property damage possible, berth will be occupied until the vessel can be safely moved or the fault rectified. Unfavourable publicity.	25	0	2	0	3		3.44	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	
Sinking/capsize 2	Recreation/Fishing vessel – berthed alongside (unattended) has a sudden ingress of water.	Vessel sinks at berth due to water ingress (loss of stability, tail gland failure, crushing, excessive rolling due to wash, pressure of wind/waves, pipe sheared off, bilge pump failure, etc) leading to vessel settling on the bottom, or rolling over, depending on water depth at time. Boat written off. Media interest leading to adverse publicity. Loss of revenue to berth owner.	50	5	4	3	3		Vessel capsizes or partially submerges but does not sink due to water ingress (tail gland failure, crushing, excessive rolling, pipe sheared off, bilge pump failure etc) immobilised vessel, berth occupied.	10	0	4	2	4		3.81	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible				Most likely	Freq. (yrs)	Most likely				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Sinking/capsize 3	Recreation/Fishing vessel – anchored or moored (unattended) has a sudden ingress of water.	Vessel sinks in open water due to water ingress (loss of stability, tail gland failure, crushing, excessive rolling due to wash, pressure of wind/waves, pipe sheared off, bilge pump failure, etc) leading to vessel settling on the bottom, or rolling over, depending on water depth at time. Boat written off. Media interest leading to adverse publicity. Wreck site forming a new navigational hazard.	50	5	4	4	3	Vessel capsizes or partially submerges but does not sink due to water ingress (tail gland failure, excessive rolling due to wash, pressure of wind/waves, pipe sheared off, bilge pump failure etc) immobilised vessel, mooring occupied.	10	0	4	2	4	3.88	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	
Sinking/capsize 4	Small fishing vessel recovering gear takes on water.	Small fishing vessel capsizes and sinks whilst recovering nets/scallop gear. Fatalities amongst the crew. Leaks from fuel tanks. Traffic movement in the vicinity is suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	4	4	3	Small fishing vessel lists to one side and takes on water but does not sink. Water and some fuel pumped out to correct the list. Minor injuries to crew. No pollution.	25	0	2	2	2	3.13	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	
Fire/Explosion 1	Fire on-board a commercial vessel (ferry/cruise/cargo).	Fire on commercial vessel (or vehicle on ferry) leading to fire/explosion, loss of life, serious pollution, total loss of vessel possible. If vessel alongside then significant damage to berth. Media interest leading to adverse publicity.	50	5	5	4	4	Ferry fire/explosion, contained by ships crews, possible injury, no pollution, minor damage to vessel. No effect on port.	10	4	4	0	2	4.00	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 101 - Guide vessel/patrol vessel.	
Fire/Explosion 2	Fire on-board a recreational/fishing boat.	Fire in the night, people sleeping and overcome by fumes leading to death or serious injury from smoke inhalation, vessel sinks at berth, minor pollution from bunkers. Berth out of action. Media interest leading to adverse publicity.	50	5	4	4	3	Fire on-board a small craft contained by the crew, minor injury, minor damage and no pollution or effect on the port.	25	2	2	0	2	3.13	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	
Fire/Explosion 3	Outbound ferry carrying incorrectly declared hazardous goods (considered as cargo when on-board the ferry) explodes.	Fire starts in vehicles/vehicle deck and spreads to the other decks of the vessel. Several crew and passengers receive serious injuries. Vessel, now stopped in the water, begins to drift (see Grounding assessment). Emergency services in attendance. Emergency declared by Coastguard and all traffic movements suspended. Media interest leading to adverse publicity	50	4	5	0	4	Fire starts on vehicle deck, on-board fire suppression system quickly extinguishes the fire. Minor injuries to crew. Vessel returns to port and disembarks passengers and, if possible, their vehicles. Emergency services in attendance. No pollution. Media interest.	25	3	5	0	3	4.00	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 24 - Contingency plan exercises - exercise for Harbour personnel. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible People Propert Planet Port				Most likely	Freq. (yrs)	Most likely People Propert Planet Port				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Ranging 1	Large vessel (i.e. ferry, cargo, large fishing) passes moored vessels at speed.	Moored vessels ranges along the quay until mooring lines part. Gangway and crew/persons on the gangway fall into the water. Vessel drifts onto adjacent berths and collides with other vessels causing damage and possible injury to crew. Pollution from fuel transfer, if in operation at the time of ranging. Media interest leading to adverse publicity.	50	5	4	4	4	Moored vessel moves excessively along the quay until mooring ropes arrest the motion. Vessel returns to original position. Gangway moves slightly but does not fall into the water. No injuries. No pollution.	10	4	0	0	0	3.56	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 98 - De-conflicting vessel interaction - approach angles to berths.	
Ranging 2	Large vessel (ie., ferry, cargo, large fishing) passes moored small craft (yacht/RIB/Powerboat) at speed.	Moored small craft range violently along the quay until moorings lines part. Crews on-board the small craft incur serious injuries. Small craft drift with wind and tide until grounding (see Ground assessment). Media interest leading to adverse publicity.	50	4	3	0	3	Moored craft move significantly as vessel passes. No damage, No injuries. Slight injuries to a number of crew and passengers from unexpected vessel movement. Possible media interest.	1	4	0	0	0	2.88	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 40 - Byelaws – control of harbour speed. 98 - De-conflicting vessel interaction - approach angles to berths.	
Aircraft operations (Helicopter)	Helicopter blade strike with vessel superstructure on take off/landing at NLB.	Blade strike with ship superstructure, helicopter crashes into Oban Bay, fatalities to helicopter crew and passengers. Small scale pollution from aviation fuel from the helicopter. Port operations in Oban Bay are suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	5	4	4	Blade contact with ship superstructure. Pilot makes a controlled emergency landing. Slight injuries to a number of crew and passengers from unexpected vessel movement. No pollution. Media attention.	25	0	0	0	4	3.63	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 98 - De-conflicting vessel interaction - landing and take-off areas. 100 - Guide to helicopter/ship operations. 101 - Guide vessel/patrol vessel.	
Aircraft operations (Seaplane) 1	Seaplane (landing) collision with large vessel (ferry, cruise, cargo, large fishing).	Loss of seaplane, fatalities to seaplane crew and passengers. Aviation fuel pollution from seaplane's tanks, moderate damage to vessel's hull but vessel remains afloat. All traffic movement through the incident area suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	5	3	4	No damage to the vessel, which maintains passage with no loss of time. Seaplane incurs superficial damage (for example, to the wing or propeller). Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. No injuries. No pollution. Media attention.	25	0	2	0	2	3.06	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Safety Management System (Loch Lomond Seaplane).	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 98 - De-conflicting vessel interaction - landing and take-off areas. 100 - Guide to helicopter/ship operations. 101 - Guide vessel/patrol vessel. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone – around seaplanes when landing/taking-off/taxiing.	
Aircraft operations (Seaplane) 2	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/kayak).	Collision, capsize and sinking of seaplane (for example, loss of one or both floats) fatalities to seaplane crew and passengers. Aviation fuel pollution from seaplane's tanks. Loss of small vessel, loss of life on vessel. All traffic movement through the incident area suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	5	3	4	Slight damage to vessel, which maintains passage with no loss of time. Seaplane incurs superficial damage (for example, to the wing or propeller). Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. No injuries. No pollution. Media attention.	25	0	2	0	2	3.06	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Safety Management System (Loch Lomond Seaplane).	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 98 - De-conflicting vessel interaction - landing and take-off areas. 100 - Guide to helicopter/ship operations. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone – around seaplanes when landing/taking-off/taxiing.	Collision between seaplane and kayak or small tender leading to fatality of the kayaker(s) and minor or no damage to the seaplane.

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible People Propert Planet Port				Most likely	Freq. (yrs)	Most likely People Propert Planet Port				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Aircraft operations (Seaplane) 3	Seaplane collides with vessel whilst taxiing.	Seaplane's wing and float on one side damaged. Seaplane lists to damaged side but remains afloat. Injury to crew and passengers, pollution from aviation fuel, slight damage to vessel's hull. All traffic movement through the incident area suspended. Media interest leading to adverse publicity.	50	4	4	4	3	Seaplane glances against the vessel's hull. No damage to the vessel. Vessel maintains passage with no loss of time. Seaplane incurs slight damage to wings. Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. No injuries. No pollution. Media attention.	25	0	3	0	2	3.00	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Safety Management System (Loch Lomond Seaplane).	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 98 - De-conflicting vessel interaction - landing and take-off areas. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone – around seaplanes when landing/taking-off/taxiing.	
Aircraft operations (Seaplane) 4	Seaplane (on take-off) collides with large vessel at speed.	With a northerly wind, a seaplane takes off into the wind (heading north) encounters an inbound vessel making passage through the entrance to Oban Bay. A collision leading to the loss of seaplane, fatalities to the crew and passengers, pollution from aviation fuel and possible fire. Damage to vessel's hull/superstructure. All traffic movement through the incident area suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	4	4	4	Seaplane glancing blow against the vessel. No damage to the vessel which maintains passage with no loss of time. Seaplane incurs minor damage i.e., wing/floats. Seaplane can make an emergency landing. Delay to seaplane whilst checks made on airworthiness. No pollution. No injuries. Media interest.	25	0	3	0	3	3.44	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Safety Management System (Loch Lomond Seaplane).	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 98 - De-conflicting vessel interaction - landing and take-off areas. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone – around seaplanes when landing/taking-off/taxiing.	
Aircraft operations (Seaplane) 5	Seaplane (on take-off) collides with small vessel (yacht/RIB/Powerboat/kayak) at speed.	With a northerly wind, a seaplane takes off into the wind (heading north. Small vessels (yacht/RIB/Powerboat/kayak) are mostly highly manoeuvrable, but also unpredictable. Potential for collision when taking off if the Master of the small craft has misjudged the seaplane's intentions. Collision, capsize and sinking of seaplane (for example, loss of one or both floats) fatalities to seaplane crew and passengers. Aviation fuel pollution from seaplane's tanks. Loss of small vessel, loss of life on vessel. All traffic movement through the incident area suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	4	4	4	Seaplane collision with small vessel, significant damage to vessel. Seaplane incurs superficial damage (for example, to the wing or propeller). Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. Minor injuries to small craft crew. No pollution. Media attention.	25	3	2	0	2	3.50	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 10 - Passage planning – carried out by Master of vessel. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 60 - COLREGS, applied within port/harbour. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Safety Management System (Loch Lomond Seaplane).	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 98 - De-conflicting vessel interaction - landing and take-off areas. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 106 - Moving exclusion zone – around seaplanes when landing/taking-off/taxiing.	Collision between seaplane and kayak leading to fatality of the kayaker(s) or small tender crew and minor damage to the seaplane.
Mechanical Breakdown (large vessel)	Large vessel (ferry, cruise, cargo, large fishing) experiences serious mechanical failure in The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	Vessel has serious mechanical failure (i.e, engine failure or steering gear failure) leading to loss of directional control. Vessel is unable to deploy anchors and other vessels unable to render assistance in sufficient time to avoid grounding (see Worst Credible grounding assessment). Media interest leading to adverse publicity.	50	4	5	4	4	Vessel has mechanical failure (i.e, engine failure or steering gear failure) anchor deployed. Other vessels perform an emergency tow to nearest port/anchorage location. Vessel remains at anchor until the mechanical problem is resolved. No pollution. No injuries. Possible media interest.	10	0	6	0	4	4.44	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 19 - Emergency Plan - Calmac (Command Decision Making Aid). 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 104 - Other harbour users/vessels	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 32 - Towing, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 101 - Guide vessel/patrol vessel.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible					Most likely	Freq. (yrs)	Most likely					Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Mechanical Breakdown (small craft)	Small vessel (yacht/RIB/Powerboat) experiences serious mechanical failure in the The Sound of Kerrera, the northerly approaches to Oban Bay or within Oban Bay.	Small craft has serious mechanical failure (i.e. engine failure or steering gear failure) leading to loss of directional control. Vessel is unable to deploy anchor in enough time, no nearby assistance available and the vessel grounds (see Grounding assessment).	50	4	5	4	4	4	Vessel has mechanical failure (i.e. engine failure or steering gear failure) anchor deployed. Vessel remains at there until towed to a berth by another small vessel. No injuries. No pollution. No media interest.	1	0	6	0	0		4.19	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 104 - Other harbour users/vessels	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel.	
Person in Water (Scallop Diving)	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a scallop diver.	Scallop Diver on 'Sgeir Rathaid', or along the northerly approaches to Oban Bay is overrun by a vessel. Scallop diver is fatally injured. All traffic in the incident area is suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	3	0	0	3	Scallop Diver on 'Sgeir Rathaid', or along the northerly approaches to Oban Bay, vessel approaches diver, sights diving flag and makes minimal use of thrusters. Close quarters (near miss) situation. Diver aware of the approaching vessel and gets out of the water. No injuries. Possible media attention.	10	0	0	0	2		2.56	60 - COLREGS, applied within port/harbour. 70 - Marine Safety Management System – diving commercial in the harbour area - Diving at Work Regulations 1997 'HSE Guidance Commercial shellfish diving in inshore water'.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local commercial operators. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions	
Person in Water (Swimmers)	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a swimmer.	Swimmers from a moored/anchored recreational boat, or swimmers in the harbour are fatally injured. All movement of traffic in the incident area is suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	5	0	0	0	3	Swimmers from a moored/anchored recreational boat, or swimmers in the harbour are identified by vessels which slow down and issue a verbal warning. Traffic affected, police/RNLI informed if a risk to life is perceived. No injuries, possible media attention.	1	0	0	0	6		3.63	3 - Communications – traffic broadcast ch.16. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 19 - Emergency Plan - Local Council (CARP). 62 - Emergency services/shoreside equipment - RNLI and Coastguard.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local schools, youth groups, public information noticeboards. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 108 - Signs – information board, warning signs, prohibited swimming areas (if appropriate).	
Person in Water (Commercial Diving)	Injury to commercial diver in water whilst vessel manoeuvring in the vicinity.	Diver in the water is sucked into the thrusters of a vessel manoeuvring alongside leading to a fatality. Diving support crew incur serious injuries in rescue attempt. All ship operations in the incident area suspended. Media interest leading to adverse publicity.	50	5	3	0	0	4	Vessel approaches diver, sights diving flag and makes minimal use of thrusters. Close quarters (near miss) situation. Diver aware of the approaching vessel and gets out of the water. No injuries. Possible media attention.	10	0	0	0	2		2.63	27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 60 - COLREGS, applied within port/harbour. 70 - Marine Safety Management System – diving commercial in the harbour area - Diving at Work Regulations 1997	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 27 - CCTV coverage – extend coverage to Oban Bay. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local commercial operators.	
Person in Water (Recreation Diving)	Recreational diver in the water is overrun by a passing vessel.	Recreational diver is fatally injured. Media interest leading to adverse publicity. This is more likely if divers access the water via the shore as divers with an accompanying diver boat are more identifiable.	50	5	0	0	0	3	Recreational diver is overrun by a vessel leading to serious injury to the diver. Media interest leading to adverse publicity.	10	4	0	0	2		3.13	60 - COLREGS, applied within port/harbour.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 27 - CCTV coverage – extend coverage to Oban Bay. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local clubs, signage and information boards at slipway launch points. 105 - Personal Watercraft Licence - controls over insurance, launching, age restrictions. 108 - Signs – information board, warning signs.	
Stranding	Extended period aground - large cruise vessel runs aground and does not lift on the next tide.	Initial recovery attempts are unsuccessful. Vessel to remain in position until recovered by salvage tugs. Damage to fuel oil tanks leading to pollution. Stranded vessel attracts national and international media interest (see Grounding assessment). Media interest leading to adverse publicity.	50	0	5	4	3	3	A survey identifies that the vessel is not holed and it remains stranded on the rocks until it floats free on the next spring tide. No injuries. No pollution. Significant media interest.	25	0	3	0	3		3.13	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 36 - Availability of pollution response equipment. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 101 - Guide vessel/patrol vessel.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible				Most likely	Freq. (yrs)	Most likely				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Other (Mooring failure)	Unlit vessel (of more than 20 metres LOA) secured to a mooring or alongside breaks free at night.	Vessel breaks free from mooring during adverse weather conditions and either grounds or is in collision with another vessel (see Grounding/Collision assessment) Media interest leading to adverse publicity.	50	0	5	4	4	Vessel breaks free and is recovered by another vessel (for example, Lifeboat) and is safely returned to its moorings. No injuries. No pollution. Possible media attention.	5	0	7	0	6	4.63	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	
Other (Fouled propeller)	Small vessel underway at night crosses a line of creel pots laid across the main shipping channel.	Small vessel picks-up one of the pot ropes in its propeller. Vessel's engine overheats and stops. Vessel drifts with no power and either grounds or is in collision with another vessel (see Grounding/Collision assessment) Media interest leading to adverse publicity.	25	5	5	3	3	Small vessel picks up one of the pot ropes in its propeller. Engine is stopped and crew manage to free the line. Small vessel continues on passage. No injuries. No pollution. Possible media interest.	10	0	2	0	0	2.88	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 19 - Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies. 21 - Oil spill contingency plan – Oban Bay and wider area. 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – extend coverage to Oban Bay. 34 - Training & authorisation of harbour personnel - training programme/matrix. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	
Other (Confusion over Buoyage)	Confusion over buoyage, vessel on a passage through The Sound of Kerrera at Ferry Rocks.	Vessel misunderstands the lateral (red/green) buoys, assuming the safe passage is between the buoys. Vessel stranded or grounds with significant damage on Ferry Rocks (see Stranding/Grounding assessment).	50	4	4	4	3	Vessel misunderstands the lateral (red/green) buoys, assuming the safe passage is between the buoys, vessel grounds with damage (see Grounding assessment).	1	6	9	0	8	5.63		57 - Aids to navigation, provision & maintenance – review of Aid to Navigation in the Sound of Kerrera to consider alternatives to existing pattern at Ferry Rocks.	
Other (vessel adrift)	Vandals release or cut through mooring lines of unmanned vessels secured to quays, jetties, piers or moorings.	Vessel drifts ashore and grounds, or drifts into the main navigation channel and become an obstruction to safe navigation. Media interest leading to adverse publicity.	50	0	5	4	4	Vessel is recovered and secured before it can drift into the main channel. Media interest.	25	0	5	0	3	3.81	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 27 - CCTV coverage – extend coverage to Oban Bay. 32 - Towage, appropriate and available – evaluation of local vessels equipped/identified to provide assistance. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches.	
Other (Traffic Density/Anchorage)	Two vessels manoeuvring around a cruise vessel at anchor in Oban Bay do not have line-of-sight of one another.	Anchored vessel presents blockage of line-of-sight, leading to the potential for a serious marine incident (fire/explosion/collision/pollution/grounding etc). Normal traffic routes significantly obstructed. Media interest leading to adverse publicity.	50	5	3	3	4	Anchored vessel presents blockage of line-of-sight, leading to the potential for a marine incident (less serious collision, close quarters situation, near miss). Normal traffic routes deviated to accommodate anchored vessel.	1	0	0	0	6	4.06	3 - Communications – traffic broadcast ch.16. 60 - COLREGS, applied within port/harbour.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 27 - CCTV coverage – extend coverage to Oban Bay. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 98 - De-conflicting vessel interaction – review of anchorage points for cruise vessels. 101 - Guide vessel/patrol vessel.	

Hazard Category	Hazard Description	Worst Credible	Freq. (yrs)	Worst Credible				Most likely	Freq. (yrs)	Most likely				Score	Risk Controls	Future Risk Controls	Risk Assessment Comments
Other (Dragging Anchor)	Large Cruise vessel at anchor in Oban Bay drags its anchor	Vessel drags anchor in adverse weather conditions towards the quays, piers and jetties. Vessel slow speed impact with quay, damaging quay and port infrastructure. Crew and passengers possible injuries during emergency disembarkation. No pollution. Media interest leading to adverse publicity.	50	1	3	0	4	Vessel drags anchor in adverse weather conditions towards the quay, piers and jetties and obstructs the approach for ferries and commercial vessels. Potential for fouled anchor with mooring buoys. Possible delays to port operations during the period the vessel recovers anchor and re-anchors. No injuries. No pollution. Possible media interest.	10	0	2	0	7	3.81	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel. 70 - Marine Safety Management System.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 27 - CCTV coverage – extend coverage to Oban Bay. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 45 - Guidance for small craft – created with stakeholder group to provide greater guidance for visiting leisure craft. 101 - Guide vessel/patrol vessel.	
Other (Wash)	Large vessel (ferry/cruise/cargo) on passage through The Sound of Kerrera / Oban Bay creates excessive wash.	Small vessels moving through the wash, or struck by the wash, are rocked violently causing serious injuries (i.e., broken leg). Small tenders (and smaller boat, ie dinghy) swamped and capsized. Effects on seaplane during landing/take-off (see dedicated Seaplane assessment) Wash/drawdown causes moored craft to range excessively with resultant damage to craft and injury to those boarding. Potential for adverse publicity.	25	3	5	0	3	Small vessel moving through the wash is able to manoeuvre to avoid significant effects. Wash will cause small craft (and seaplanes) to roll if encountered beam-on, but without incurring crew injuries or damage.	1	0	3	0	2	3.00	1 - Code for safe navigation in Oban Bay. 3 - Communications – traffic broadcast ch.16. 60 - COLREGS, applied within port/harbour.	1 - Code for safe navigation in Oban Bay – reviewed and updated to reflect current vessel traffic type and volume. 3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 27 - CCTV coverage – extend coverage to Oban Bay. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders.	
Pollution	Pollution from bunkering (refuelling) operations within Oban Bay.	Wind and current spread the oil across the Bay until it is in contact with moored vessels, particularly vessels with GRP hulls. Fuel comes ashore on Oban foreshore with serious environmental effects. Tier 2 oil spill response initiated. Possible suspension of ship operations in Oban Bay by Temporary Exclusion Zone during the oil recovery phase. A significant number of compensation claims are filed against the vessel/berth owner responsible for the spill. Media interest leading to adverse publicity.	50	0	3	4	4	Fuel spill contained by a Tier 1 response. Remaining oil spreads in a light sheen across Oban Bay. Vessel traffic movement in the incident area effected. Media interest.	10	0	2	4	2	3.19	3 - Communications – traffic broadcast ch.16. 19 - Emergency Plan - Local Council (CARP). 21 - Oil spill contingency plan (A&BC). 22 - Oil spill contingency plan (Calmac). 24 - Contingency plan exercises - exercise for Harbour personnel. 27 - CCTV coverage – A&BC. 27 - CCTV coverage – CMAL. 34 - Training & authorisation of harbour personnel – limited to the boundary of the current Harbour Authorities. 36 - Availability of pollution response equipment. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority. 62 - Emergency services/shoreside equipment - RNLI and Coastguard. 69 - Training of pollution response personnel.	3 - Communications – traffic broadcast dedicated VHF channel for Oban Harbour. 3 - Communications – one point of contact for Oban Bay and its Approaches. 3 - Communications – website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events and activities, relevant contacts for services and emergency contact points. 9 - Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity. 21 - Oil spill contingency plan – Oban Bay and wider area. 21 - Oil spill contingency plan – MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues. 27 - CCTV coverage – extend coverage to Oban Bay. 38 - Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders. 39 - Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches. 101 - Guide vessel/patrol vessel. 103 - Education - coordinated by Harbour Authority and emergency services regarding bunkering operations, provided to local clubs and commercial operators in the harbour.	

Appendix C

Risk Controls and Future Risk Controls



C. Risk Controls and Future Risk Controls

Table C1. Existing controls

Pos.	Existing Controls		Count
1	62	Emergency services/shoreside equipment - RNLI and Coastguard.	35
2	3	Communications - traffic broadcast ch.16.	34
3	19	Emergency Plan - Local Council (CARP).	34
4	36	Availability of pollution response equipment.	32
5	69	Training of pollution response personnel.	31
6	24	Contingency plan exercises - exercise for Harbour personnel.	24
7	34	Training & authorisation of harbour personnel - limited to the boundary of the current Harbour Authorities.	24
8	39	Harbour Masters powers of direction (Special Direction) - directions issued to traffic (A&BC), limited to the boundary of the current Harbour Authority.	22
9	39	Harbour Masters powers of direction (Special Direction) - directions issued to traffic (CMAL), limited to the boundary of the current Harbour Authority.	22
10	21	Oil spill contingency plan (A&BC).	20
11	22	Oil spill contingency plan (CalMac).	20
12	60	COLREGS, applied within port/harbour.	20
13	10	Passage planning - carried out by Master of vessel.	19
14	70	Marine Safety Management System.	18
15	1	Code for safe navigation in Oban Bay.	16
16	19	Emergency Plan - CalMac (Command Decision Making Aid).	11
17	27	CCTV coverage - A&BC.	9
18	27	CCTV coverage - CMAL.	9
19	57	Aids to navigation, provision & maintenance - buoyage.	5
20	70	Safety Management System (Loch Lomond Seaplane).	5
21	57	Aids to navigation, provision & maintenance - Sector lights.	3
22	104	Other harbour users/vessels	2
23	70	Marine Safety Management System - diving commercial in the harbour area - Diving at Work Regulations 1997	1
24	70	Marine Safety Management System - diving commercial in the harbour area - Diving at Work Regulations 1997 'HSE Guidance Commercial shellfish diving in inshore water'.	1
		Total	417

Table C2. Future controls

Pos.	Future Controls		Count
1	3	Communications - one point of contact for Oban Bay and its Approaches.	41
2	9	Local Port Services - Harbour control office appropriately equipped and manned to meet the scale of harbour activity.	41
3	3	Communications - website with relevant Oban Bay safety information, changes to promulgated ferry timetables, events relevant contacts for services and emergency contacts.	40
4	3	Communications - traffic broadcast dedicated VHF channel for Oban Harbour.	39
5	39	Harbour Masters powers of direction (Special Direction) - directions issued to marine traffic in Oban Bay and approaches.	30
6	101	Guide vessel/patrol vessel.	29
7	19	Emergency Plan - Oban Bay and wider area, developed to address range of navigation emergencies.	28
8	21	Oil spill contingency plan - Oban Bay and wider area.	28
9	21	Oil spill contingency plan - MoU between A&BC, CMAL and NLB formalising mutual assistance for Oil Spill, call out procedures for responders, cost sharing and liability issues.	27
10	34	Training & authorisation of harbour personnel - training programme/matrix.	24
11	27	CCTV coverage - extend coverage to Oban Bay.	22
12	45	Guidance for small craft - created with stakeholder group to provide greater guidance for visiting leisure craft.	22
13	38	Harbour Authority powers of General Direction - issued after prior consultation with harbour Stakeholders.	20
14	1	Code for safe navigation in Oban Bay - reviewed and updated to reflect current vessel traffic type and volume.	18
15	24	Contingency plan exercises - exercise for Harbour personnel.	17
16	103	Education - coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	12
17	105	Personal Watercraft Licence - controls over insurance, launching, age restrictions.	11
18	32	Towage, appropriate and available - evaluation of local vessels equipped/identified to provide assistance.	9
19	40	Byelaws - control of harbour speed.	9
20	107	Reduced visibility routine - limit on speed and departure/arrival for large vessels, regular traffic information dissemination.	8
21	7	Pilotage service.	8
22	8	PECs, authorisation and control of.	8
23	41	Notices to mariners - issued to manage vessels activity and behaviour within the harbour.	7
24	70	Marine Safety Management System - develop to include wider harbour area.	7
25	95	Harbour standing orders - developed from Risk Assessment approach.	7
26	103	Education - coordinated by Harbour Authority and emergency services, local activity centres, local clubs and commercial operators.	6
27	45	Guidance for small craft - appropriate information available in yachting/nautical publications.	6
28	106	Moving exclusion zone - around large vessel when exiting/entering Oban Bay.	5
29	106	Moving exclusion zone - around seaplanes when landing/taking-off/taxiing.	5
30	98	De-conflicting vessel interaction - landing and take-off areas.	5
31	57	Aids to navigation, provision & maintenance - review of Aid to Navigation in the Sound of Kerrera to consider alternatives to existing pattern at Ferry Rocks.	4
32	100	Guide to helicopter/ship operations.	3
33	103	Education - coordinated by Harbour Authority and emergency services, local commercial operators.	2
34	98	De-conflicting vessel interaction - approach angles to berths.	2

Pos.	Future Controls		Count
35	98	De-conflicting vessel interaction - review of anchorage points for cruise vessels.	2
36	98	De-conflicting vessel interaction - small craft channel Western side of harbour entrance.	2
37	99	No sailing zone - seasonal use to reduce potential for collision, exemptions applied for organised racing.	2
38	103	Education - coordinated by Harbour Authority and emergency services regarding bunkering operations, provided to local clubs and commercial operators in the harbour.	1
39	103	Education - coordinated by Harbour Authority and emergency services, local clubs, signage and information boards at slipway launch points.	1
40	103	Education - coordinated by Harbour Authority and emergency services, local schools, youth groups, public information noticeboards.	1
41	108	Signs - information board, warning signs, prohibited swimming areas (if appropriate).	1
42	108	Signs - information board, warning signs.	1
Total			561



ABP Marine Environmental Research Ltd (ABPmer)
Quayside Suite, Medina Chambers, Town Quay, Southampton SO14 2AQ

T +44 (0)23 80 711840

F +44 (0)23 80 711841

E enquiries@abpmer.co.uk

www.abpmer.co.uk

Creating sustainable solutions for the marine environment