TRANSFER OF LIQUID CARGO
BETWEEN VESSELS (OIL)
Portland Harbour Jurisdiction

Environmental Statement Appendices Part 1 Chapters 1-10

In support of an application by
Portland Harbour Authority,
to the Maritime and Coastguard Agency,
for an Oil Transfer Licence,
in accordance with the requirements of the
Merchant Shipping (Ship-to-Ship Transfers) Regulations 2020

version-21st June 2021

Appendices Part 1 Contents

Chapter 1. Introduction

Chapter 2.

Approach to Assessment Methodology

None apply

Chapter 3. Proposals

Chapter 4. Human Beings

Chapter 5. Fauna and Flora

Chapter 6. Water

Chapter 7. Air and Climate

None apply

Chapter 8. Landscape and Seascape

None apply

Chapter 9. Material Assets

None apply

Chapter 10. Cultural Heritage

None apply

Appendices Chapter 1. Introduction

Appendix 1.1 –

Record of Pre Application Consultation – Harbour Consultative Committee

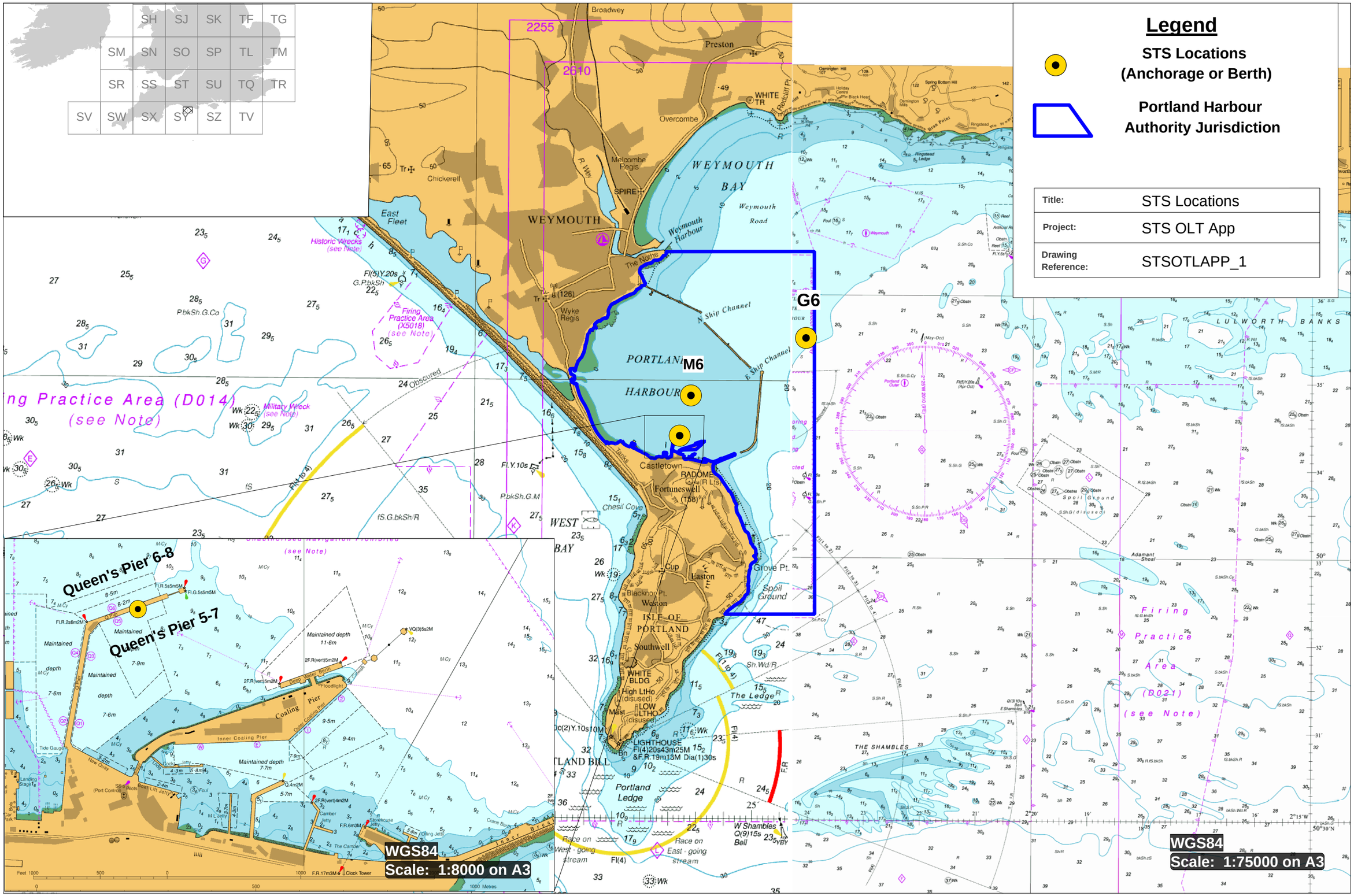
From: Sandie Wilson
Sent: 27 May 2021 16:09
To: Sandie Wilson <S.Wilson@portland-port.co.uk>
Cc: Michael Shipley <m.shipley@portland-port.co.uk>; Mark Rowles <M.Rowles@portland-port.co.uk>
Subject: RE: Pre-submission draft FOR HCC: Documents for Portland Oil Transfer Licence Application to MCA

Dear HCC members
(with attachments)
As discussed in our April meeting of the Harbour Consultative Committee meeting, I am now writing with details of our pre-submission draft documents we are sharing with you ahead of an application to the Maritime & Coastguard Agency for an Oil Transfer Licence.
We would appreciate if you could review these documents and come back with comments/ questions/ feedback that may arise. We ask that you provide your feedback by Friday June 11th.
The documents shared include the Location Plan of STS Locations, Draft Environmental Statement, Draft Environmental Statement Appendices. A link for the documents is here and I have also attached the contents list and location plan to this email.
Once the documents have been finalised they will be submitted to the MCA with a covering letter for their consideration. The formal process includes a public consultation so we will be placing an advert in the Dorset Echo that we have submitted an application. The application will be available to view on our website aswell as other locations to be decided. The formal consultation period is 42 days.
I look forward to hearing from you once you have had an opportunity to consider the draft documentation. I am now on leave returning Monday 7th June and happy to arrange a telephone or video call if this would be helpful to talk through the proposals on my return.
Best regards
Sandie
Sandie Wilson
Portland Harbour Authority / Portland Port Limited
+44 (0) 7909 970 449
s.wilson@portland-port.co.uk

Attachments

1. Portland OTL-application LocationPlan Draft FOR HCC
2. Portland OTL-application ES Contents Draft FOR HCC

Documents on link are as per contents list


Legend
STS Locations
(Anchorage or Berth)
Portland Harbour
Authority Jurisdiction
Title: STS Locations
Project: STS OLT App
Drawing Reference: STSOTLAPP_1
G6
M6
Queen's Pier 6-8
Queen's Pier 5-7
WGS84
Scale: 1:8000 on A3
WGS84
Scale: 1:75000 on A3

Appendices Chapter 3. Proposals

Appendix 3.1 –

Business Case for STS Transfers at Portland Harbour

Appendix 3.2 –

Guide - Transfer Operations between Vessels of Liquid Cargoes at Portland Harbour

Appendix 3.3 –

Oil Spill Modelling Report

Appendix 3.4 –

Oil Spill Modelling Output Videos – see separate link

Appendix 3.5 –

Oil Spill Modelling Report additional explanatory note

Appendix 3.1 –

Business Case for STS Transfers at Portland Harbour

Appendix3.1 Business Case for STS Transfers at Portland

3.1. Introduction

Portland Harbour is located on England's south coast just a short distance from the main Channel shipping lanes. Situated in Weymouth Bay the Harbour is sheltered from the prevailing south westerly winds by the Isle of Portland itself and benefits from an extensive breakwater system. Benefitting from deep, clear, safe waters Portland Harbour has been the home for a range of in water activities since being privatised in 1996. The harbour is regularly used for in-water surveys, hull cleaning, in-water repair, ownership changes and has long been home to a bunker operation, currently operated by Portland Bunkers UK Ltd. in conjunction with Monjasa. Ship to Ship (STS) operations will be a logical addition to the range of services on offer within the Harbour. Portland Harbour offers an ideal solution to the lack of a managed STS location in the English Channel area and can provide an appropriate alternative to the congested STS facilities in Rotterdam.

3.2. Abstract of Findings

The STS industry activity is fundamentally driven by market conditions such as regional supply/demand, cargo flows/trends and most recently seen in 2020, a Global situation. These fluctuations in the market are known as contango or backwardation which are part of the controlling factors when Traders decided whether they require the need for Ship to Ship.

During 2020 there was in excess of 150 Ship to Ship operations in and around UK territorial waters and it is reasonable to assume that Portland Harbour authority will be able to capture at least 15% of this market. Our focus will be to capture seasonal business, providing an alternative, controlled location when weather conditions are unfavourable offshore and omitting the need for vessels to transit heavy density traffic areas such as the Dover Straits to arrive at alternative STS locations.

3.3. Background

Ship to Ship (STS) transfers of oil & LPG take place in four main locations in the UK and Europe, namely underway off Southwold on the east coast of England, Rotterdam in the Netherlands, the Skaw on the Jutland Peninsula in Denmark, and Scapa Flow in Orkney. Portland Harbour on the South Coast of the UK has a long history or providing auxiliary services to a wide range of shipping activities at our designated anchorages, such as crew reliefs, provisions and bunkering. Through our own due-diligence we have now approved an established ship to ship transfer company at the Port to provide LPG transfers.

In connection with this service provider utilising our sheltered anchorage we believe we can provide the industry with a highly effective alternative location to that of open sea Ship to Ship.

3.4. STS Location Choices

STS operations around the UK, Europe and the World are conducted and charged differently depending on the local port regulation and the Maritime and Coastguard Agency regulations and / or other national authority requirements.

Operations vary in methodology with Rotterdam utilising alongside jetties or designated mooring dolphins, Southwold underway and occasionally making way, whilst STS operations at Scapa Flow and the Skaw undertake cargo transfer at anchor.

At Portland Harbour we will be unique in providing the opportunity to undertake the transfer of cargo both at anchor and alongside.

The overall choice of STS location (i.e. on a UK, Europe and Worldwide basis) depends on many influences including:

Source of cargo – including source locations which restrict vessel size or construction vis ice affected areas.

Routes of cargo – vis choke points for STS operations.

The safety case.

Placement/location of vessels.

Port dues/costs.

Time critical transfers/laycan dates.

Availability of berth – not an issue for STS at anchor.

Charter rates.

Cargo type.

Vessel classification.

Weather – vis the need for shelter and ease of arrival/departure in all conditions.

Safety case considerations.

Ballast regulations.

Environmental factors.

Market forces/conditions.

3.5. Portland Harbour

To properly evaluate why STS operations within Portland Harbour will be attractive to the market we have undertaken a full SWOT analysis the results of which can be found below.

STRENGTHS

Geographical positioning in relation to major trading routes;

Avoidance of high density traffic transit areas;

Reduced weather exposure compared to open sea STS locations;

Providing the market with a new, deep water, alternative location;

Choice of locations both alongside and at anchor;

Support of an established STS company already on site and approved;

Harbour Authority controlled pilots and towage;

Extensive area of controlled harbour waters for STS operations;

Deep water anchorages;

Complimentary support services within port area;

24/7 operation;

Extensive experience in handling bunker operations;

Established pollution response with an enhanced Tier 1 provision;

Robust procedures for the ensuring of navigational safety and environmental management;

Port Marine Safety Code compliant with regular external audits;

Flexible business approach;

Only south coast STS location;

Short pilotage;

Congestion free operations;

Potential reduced sailing times with associated emissions savings;

Location is NOT within any environmentally designated area.

WEAKNESS

Currently unproven in STS operations;

Currently, not an established STS location;

Largely unknown location with oil / LPG / chemical operators;

Operational capacity unclear until operations start;

Currently only one tug capable of outer harbour operations (being addressed);

Tug manning for multiple tugs;

Delay risks in outer harbour from weather in the SE quadrant;

Harbour office manning during STS operations;

Potential of increased pilotage demands.

OPPORTUNITIES

Offering a turn key solution to the market;

Expanding the Port's portfolio of services;

Financial growth;

Providing additional revenue to the local community through auxiliary services;

LNG (bunkering, large and small scale STS);

Accommodating floating storage packages;

Supply of ancillary services to ships calling for STS;

Heightened awareness of location for other activities;

MARPOL barge;

Opportunity for pollution response base location;

Location for STS drill and exercises in a controlled environment by counter pollution bodies;

Enhanced manning and towage capabilities will potentially open up other new business opportunities.

THREATS

Demand exceeding operation capabilities, resulting in delays;

Major incident/Pollution;

Potential local opposition to STS operations;

Sub-standard 3rd party practices;

Delay or failure to secure approvals from regulatory bodies.

We have undertaken a review of the weaknesses identified by our SWOT analysis to identify where and how solutions may be found. Taking a pragmatic approach many of the perceived weaknesses can be addressed in a timely manner as the business develops and grows:

The proposed marketing strategy to support the commencement of STS operations will address the lack of knowledge of Portland Harbour both as a location for STS activities but also with the shipping lines most likely to be involved in the sector;

Manpower is predicated on business demand and as STS operations commence an ongoing review will take place. As demand for STS services expands port manpower will be monitored to ensure that we can fully service all our customer demands both current and future whether this is through additional pilots, tug crew or marine officers;

The towage capability of the port is being enhanced with the delivery of a new tug in March 2021. This new vessel has significantly enhanced capability when compared to the tug it is replacing with a bollard pull of over 50t. The new tug will also be fully capable of operating in the outer harbour area year round. Additional towage capability has been identified locally and can be used to supplement the ports own fleet of tugs should demand warrant this.

3.6. STS Business Overview

Whilst past performance is no guarantee of future business, it is a good benchmark for establishing opportunity levels.

The business of STS has been, and is, lucrative, but totally driven by the supply and demand for oil on a global scale. Due to dramatic fluctuations in oil prices and regional demand, the industry can be categorised as commercially 'opportunistic'.

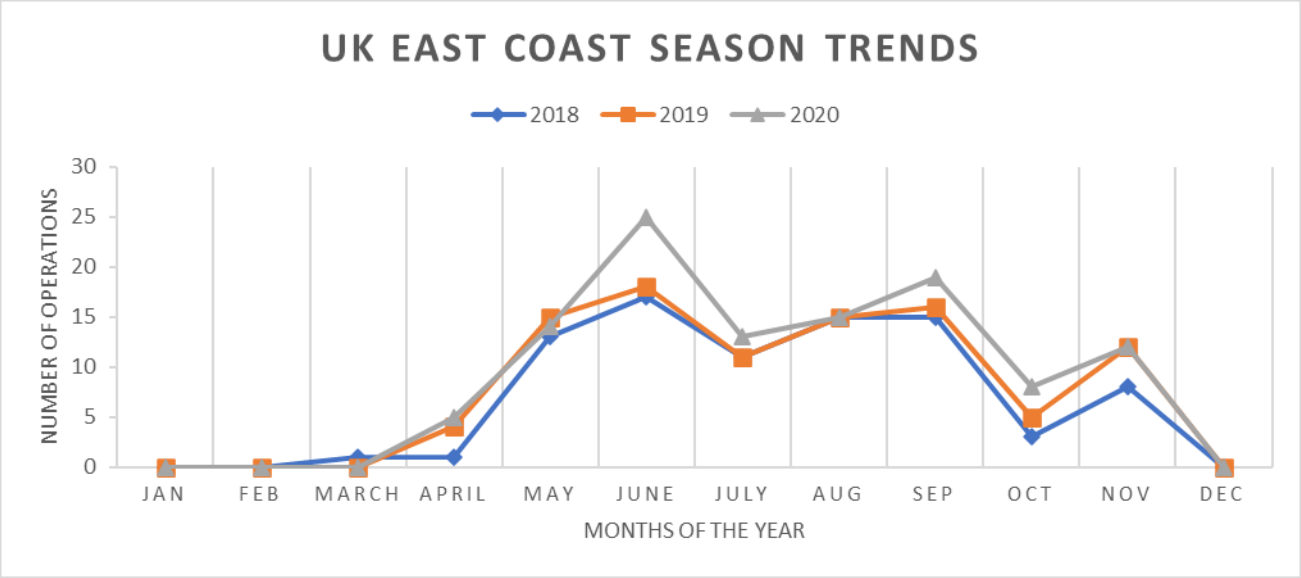
Through our SWOT & GAP analysis we have determined our business strategy for making Portland a viable option to the industry for Ship to Ship transfers. Our focus will be twofold:

STS operations off the east coast of England are very susceptible to bad weather and, as such are highly seasonal. As the winter months approach a large proportion of business moves from this location to ARA (Amsterdam, Rotterdam, Antwerp) taking the local community revenue with it to our near neighbours in Europe. Offering an alternative at Portland will ensure that these economic benefits are retained in the UK, enabling re-investment within the port, enhancing our portfolio of services and ultimately creating new jobs.

We are aware of capacity constraints in Rotterdam impacting on STS operations there and believe that Portland will offer the logical alternative. Over 15m tonnes of liquid product are trans-shipped each year in Rotterdam and the port is very aware that they missing out on additional volumes which cannot be accommodated.

The graph below shows the estimated volumes of STS on the East coast of the UK during the past three years:

Figure A3.1-1 – Estimated STS Operations on UK East Coast 2018 - 2020



3.7. STS Business Overview – Commercial Opportunity

For Portland Harbour to offer a competitive advantage as a sheltered location for STS operations, and bearing in mind that operations at sea do not incur port dues (only facilitator dues), the Harbour Authority has ensured that pricing structures are both competitive and profitable.

Economies of scale will come into play; the Harbour Authority hopes to find itself being able to attract future volume business and having the flexibility to structure our charges to encourage single agent/operator volume long term consolidated business. The current charging method is predicated on port and harbour dues based on the gross tonnage of the vessels involved along with cargo dues for the tonnage of product being transhipped. Other services provided by the Harbour Authority, such as pilotage and towage, would be charged for in accordance with the port's published tariff. All charges associated with the actual transfer of product itself would be levied by our approved service providers.

By offering the potential to undertake STS operations either alongside or at anchor in the inner or outer harbour the port can offer a number of solutions. As such the potential capacity of Portland to accommodate STS operations during a range of weather conditions is high. Theoretically it would be possible to undertake three STS operations simultaneously using both anchorages and the allocated berth. However, logistically this would be impractical, certainly in the short to medium term. If demand warranted, however, the port would be able to add resource to increase our capability to handle multiple operations at any one time.

Based on the start-up phase of operations it is realistic to take the following view:

UK STS market - 150 operations per annum;

Portland STS locations – 3;

Theoretical capacity (1 STS per week per location) – 150 operations;

Realistic capacity (1 STS per week 1 location) – 50 operations;

Market penetration – 16%;

Therefore, target volume – 24 operations per annum.

On the basis of this data it can be seen that the target is conservative both in terms of market share and available capacity. It is realistic to anticipate that this target can be exceeded over time as Portland becomes established as a location for STS activities and enhances its capabilities with the addition of further resource. It is hoped that by having an unrestricted licence the business will be allowed to develop and grow as dictated by market demand.

3.8. Market Capture

In order to capitalise on the identified opportunity for a new Portland STS location, our strategy would involve a targeted marketing campaign. The marketing of Portland Harbour as an STS location is already in motion for LPG activities but to ensure we capture the Oil sector we will be undertaking the following activities:

Immediate, strong marketing campaign utilising digital social media platforms, digital advertising and E mail marketing;

Leveraging our approved STS provider's relationship with their customers to promote our location;

Leveraging our existing business contacts and relationships in the tanker community;

Market research for into opportunities in the long-term oil storage market for Portland;

Seamless operations for proof of concept site visit by agents and facilitators to observe towage, counter pollution equipment and response, VTS and pilotage.

On the basis of the above marketing activity we have produced a business model reviewing three scenarios to forecast STS revenues for Portland Harbour. The assumption behind the scenarios is that 35,000 tonnes of product is transhipped from an Aframax size vessel to an Handymax size vessel during each STS operation.

	ANNUAL SCENARIOS		
	WORST	BASE	TARGET
Annual transfers	4	12	24
Port and harbour dues	£108,800.00	£326,400.00	£652,800.00
Pilotage	£12,360.00	£37,080.00	£74,160.00
Cargo dues	£112,000.00	£336,000.00	£672,000.00
Towage	£35,760.00	£107,280.00	£214,560.00
Total Revenue	£268,920.00	£806,760.00	£1,613,520.00

All three scenarios are conservative, some in the extreme. The base assumptions are designed to be eminently achievable and it can be realistically expected that volumes and vessel sizes will be larger than those used in the modelling. However, even under the worst case scenario of just a single STS operation per quarter the potential revenue to the business is worthwhile and justifies the investment in securing the necessary OTL.

3.9. Return on Investment

On the basis of the case presented above, the net financial benefits to Portland Harbour Authority, and indeed the wider local area, are strong. Other than the costs associated with the application for the new Oil Transfer Licence, there are no immediate investment costs associated with Portland Harbour as an STS location of choice. The infrastructure, vessels and expertise are already in place and each STS will swiftly offset costs already committed. Furthermore, achieving the targeted level of business will enable early investment in additional resource to allow for an expansion of STS operations as well as to support other port activities.

Other benefits will accrue from:

Ships Agents activity;

Storage and deployment of fenders;

STS service provider charges;

Provision of supplementary vessel services;

Crew change and associated accommodation and transport expenditure.

3.10. Business Risk

The business risk is limited. Whilst costs will be incurred in marketing STS operations within Portland Harbour, the initial operational activities will be undertaken utilising existing resources. As the market develops and grows further investment will be undertaken in accordance with the GAP analysis and based on a known commercial requirement. Operational risks are not the subject of this report and are covered elsewhere in the OTL application.

3.11. Conclusion

In conclusion, it is assessed that the likely base level of STS business is in the range of 12 – 24 operations per annum. Even in an unrealistic worst case scenario of only 4 operations a year the incremental revenue generated still makes the operation attractive. At a base level of 12 operations per annum it is anticipated that annual revenues would be in the order of £800,000. This figure does not take into account any wider economic benefits to the local area that the additional vessel movements might generate. There is a gap in the market for a south coast Ship to Ship location and Portland Harbour offers a genuine, economically viable solution.

Appendix 3.2 –

Guide - Transfer Operations between Vessels of Liquid Cargoes at Portland Harbour

Guide

Transfer Operations between Vessels of Liquid Cargoes

Portland Harbour

PORTLAND HARBOUR AUTHORITY

Version May 2021

Overview

This document aims to serve as a high level guide for transfers operations of liquid cargoes between vessels in Portland Harbour (sometimes referred to as Ship to Ship (STS) transfers). This is so that those with a decision-making role and/ or interest can further understand the operation and the robust measures that are in place to ensure transfer operations are managed with health, safety and environment at the heart.

The guide refers to the following projects all of which involve transfer of liquids between vessels:

a) **Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases)**
b) **Liquid Petroleum Gas**
c) **Liquid Cargoes (substances consisting wholly or mainly of oil)**

For the purpose of defining oil, the definition in The Ship to Ship Regulations 2020 applies in which this is "oil of any description and includes spirit produced from oil of any description, and also includes coal tar" (same as that in the Merchant Shipping Act 1995).

The guide includes the following sections:

1. Transfer Operation Overview
2. Local regulations and relationship with UK legislation, International Codes and Conventions
3. Service Provider Approval
4. Notification Requirements
5. Person in Overall Advisory Control (POAC)
6. Equipment
7. Contingency Planning
8. Transfer Operation Procedure
9. Planning a Transfer Operation
10. Maintaining Records
11. Key Documentation

Portland Harbour has a long history of offering bunkering to vessels which shares similarities to transfer operations. General Direction No1 of 2016- Portland Harbour Bunkering Operations available here for reference purposes.

1. Transfer Operation Overview

A transfer operation (or STS operation) in this case is the transfer of liquid cargoes between vessels. It can be at sea while underway, at anchor or alongside berth but in the case of Portland Harbour it will only take place whilst at an anchorage or alongside a berth at the locations shown in **Figure 1**, and not whilst underway.

Roles and Responsibilities

Harbour Authority - The Harbour Authority gives permission for a service provide to operate within their port. It also provides initial authorisation for transfer operations. Additional services include pilotage and towage if required. Portland Port provides storage for equipment. The harbour authority, or a delegated subcontractor provide a service vessel for handling and transfer of equipment to the Mother and Daughter Vessels needed in a transfer operation.

Service Provider - The service provider creates the Joint Plan of Operation for the transfer operation which includes risk assessments and mooring plans. The service provider also provides the Superintendent/Mooring master who oversees the transfer and mooring operation. The Superintendent/Mooring Master overseeing the transfer operation will act as the Person in Overall Advisory Control (POAC).

Mother Ship and Master - Retains their duties and responsibilities and control of their vessel. Liaises with service provider and other master of daughter vessel in the creation of the Joint Plan of Operation.

Daughter Ship(s) and Master(s) - Retains their duties and responsibilities and control of their vessel. Liaises with service provider and the master of the mother vessel in the creation of the Joint Plan of Operation.

Waste Handling/Cleaning Contractor - Responsible for the decontamination, cleansing and testing of hoses and appropriate disposal of waste

Other parties include: Ship agent, Ship broker/charterer, Ship owners, STS agent.

Figure 1a and b is a location plan for where liquid transfer operations in Portland Harbour will take place and includes:

- Anchorages: Outer/Inner Harbour: G6, M6
- Alongside berths: Queens Pier (5,6,7,8)

Figure 2 is an overview of the transfer operation process including the following:

- Pre-transfer planning
- Pre-transfer manoeuvring and mooring
- Hose connection
- Transfer operation
- Disconnection and Equipment Cleansing

Measures

Mitigation measures applied in order to determine that there is no significant effects on the environment include the following:

- Application of best practice in proposed cargo transfer activities.
- Application of the Pollution Preparedness and Contingency Plan
- Application of robust control procedures in place to minimise the likelihood and potential of an oil spill.
- Transfer between ships undertaken using industry standard certified hoses.
- Ships having trained and experienced crew to undertake transfer operations.
- Use of an Approved Service Provider and qualified Person In Overall Controll to oversee transfer operation.
- Application of onsite spill response procedures and equipment being mobilised to ensure spill doesn't reach sensitive sites.
- Positioning of fenders in a manner in which they create a barrier to contain any oil that may be spilt in the unlikely event of a hose failure.
- Comprehensive stock of oil spill containment equipment held at various sites ready for deployment in case of an incident.
- Back-up contractor for Tier 2 response.
- Availability of well trained staff to respond to pollution spill.

Figure 1a. Location Plan for Transfer Operations in Portland Harbour

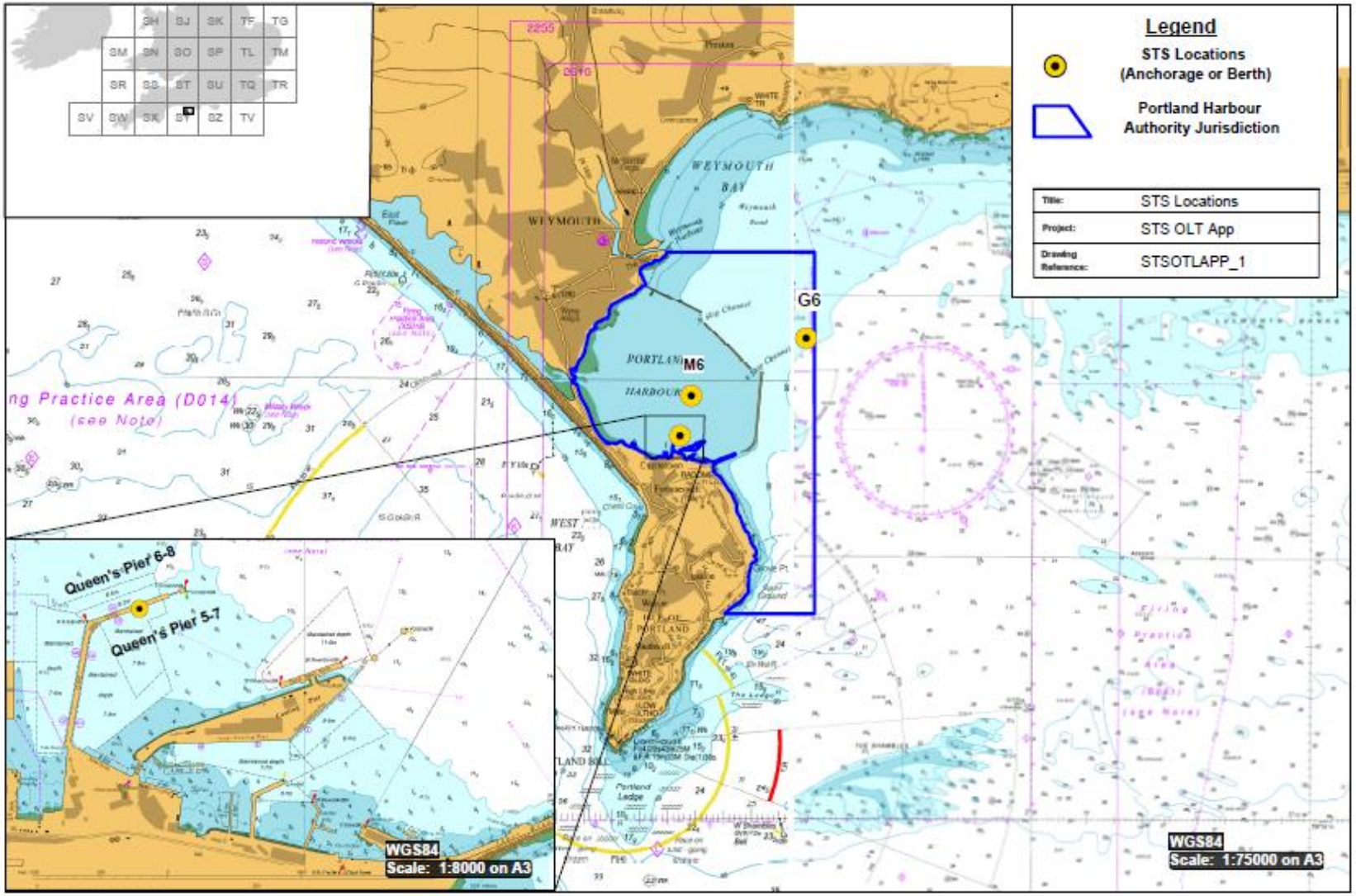
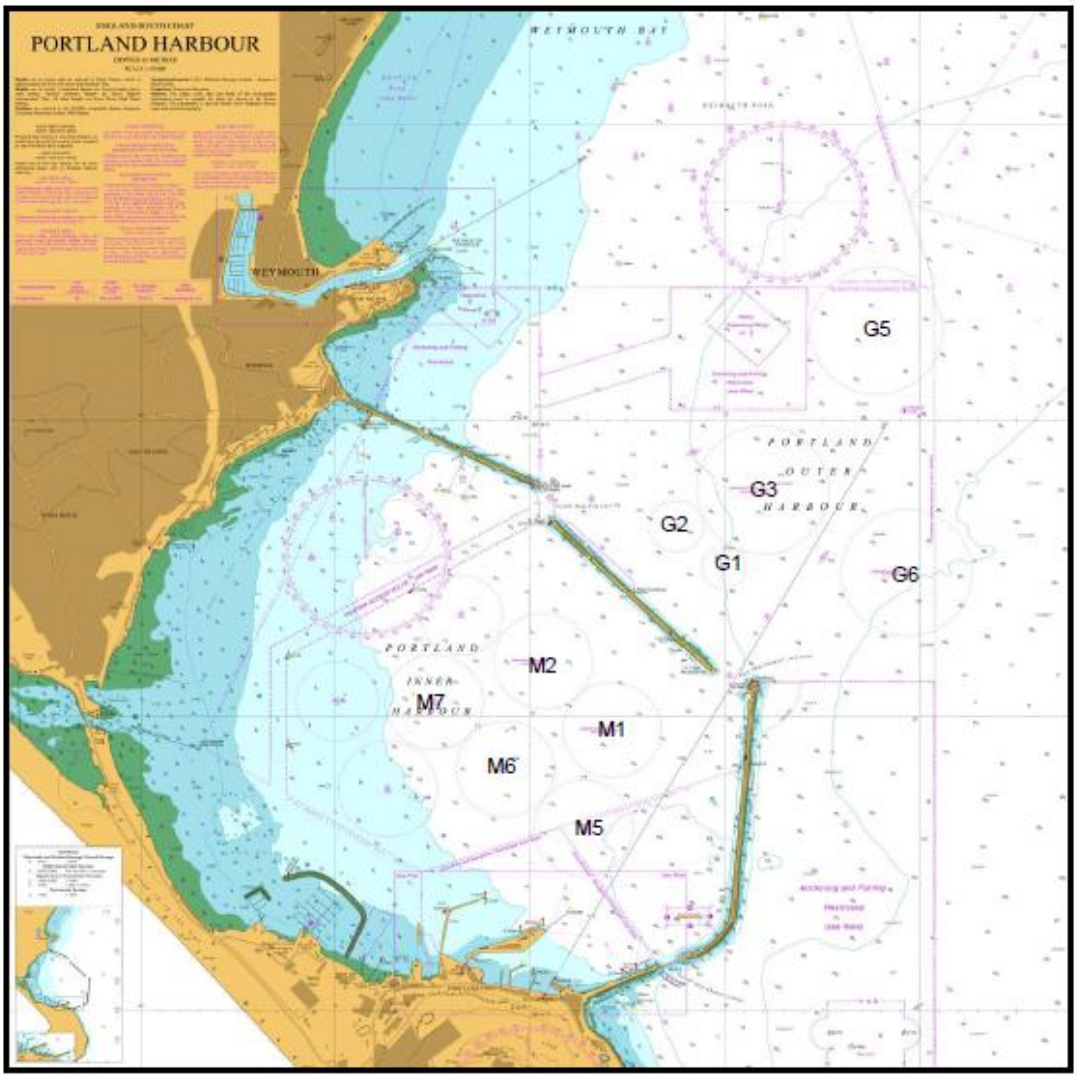


Figure 1b Passage Plan showing Anchorages and Berths



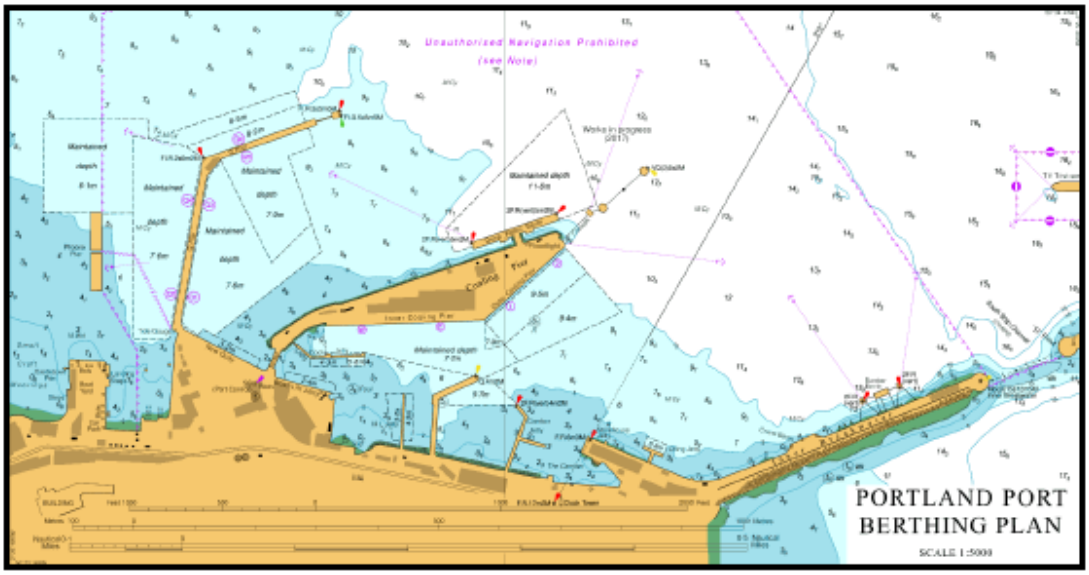
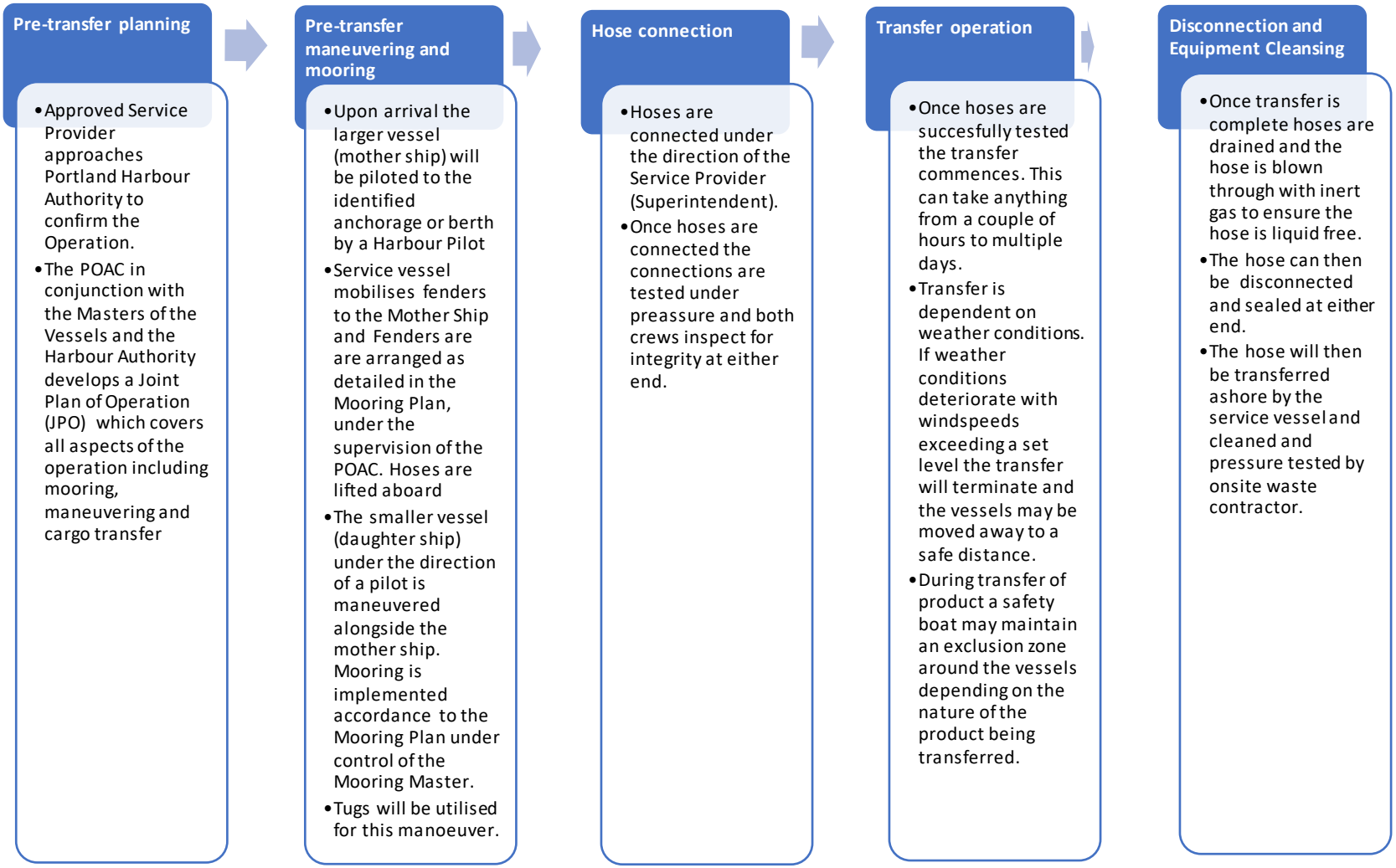


Figure 2. Transfer Operation Process



2. Local regulations and relationship with UK legislation, International Codes and Conventions

The transfer of liquid cargoes between vessels is regulated by Portland Harbour Authority through 3 General Directions created under the Portland Harbour Revision Order 1997 as follows:

1. Transfer of Liquid Cargoes excluding Oil and Liquified Gases between Vessels **Project (a)**
2. Transfer of Liquid Petroleum Gases between Vessels **Project (b)**
3. Transfer of Liquid Cargoes consisting of Oil between Vessels **Project (c)**

In the case of above the definition of oil is as defined by Marpol Annex 1 applies which although is different to that of the Ship to Ship Regulations 2020 they are considered to mean the same. In Marpol Annex 1 Oil is *"petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products (other than those petrochemicals which are subject to the provisions of Annex II of the present Convention) and, without limiting the generality of the foregoing, includes the substances listed in appendix I to this Annex."*

In practice this means for all of the substances under 3 above the harbour authority must first secure an Oil Transfer Licence before these can take place.

The General Directions correspond directly with International Conventions and their Codes where applicable as follows:

1. The General Direction for *"Transfer of Liquid Cargoes excluding Oil and Liquified Gases"* is intended to cover the transfer between vessels of substances listed in the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code). These substances fall under MARPOL Annex II - Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk.
2. The General Direction for *"Transfers of Liquid Petroleum Gases"* is intended to cover the transfer between vessels of liquid gases as defined in Section 1.1.1 and or Chapter 19 of The International Code for the Constructions and Equipment of Ships Carrying Liquified Gases in Bulk (IGC Code).
3. The General Direction for *"Transfer of Liquid Cargoes consisting of Oil"* is for the transfer between vessels of substances which meet the definition of Oil in MARPOL Annex I – Regulations for the Prevention of Pollution by Oil. Rather than there being a Code in this instance, Chapter 8 of Annex I covers the transfer of oils between vessels applies.

With regards to **ballast water management and air quality** we draw your attention to paragraphs 13 and 14 of the above General Directions with details of the measures put in place during transfer operations.

3. Service Provider Approval

Transfer operations shall be carried out under the guidance and supervision of a service provider approved by Portland Harbour Authority to carry out the relevant type of operations.

1) The approved service provider shall:
   a) to the widest extent possible, use the recommendations of the "Ship to Ship - Service Provider Self-Assessment (SPSA)" programme; and
   b) use a quality assurance system ensuring that their tasks are performed in accordance with this order; and
   c) all transfer operations shall be carried out in accordance with the guidance contained in the "Ship-to-Ship Transfer Guide – for Petroleum, Chemical and Liquefied Gases" published by CDI, ICS, OCIMF and SIGTTO (latest edition).
2) The approved service provider shall only allow personnel meeting the requirements in paragraph-3 to be responsible for guidance and supervision of transfer operations.
3) Persons performing guidance and supervision of operations shall:
   a) have internationally recognised skills and experience corresponding to that of a senior officer on a tanker of the same type as those between which the transfer operation is to be carried out,
   b) be in possession of a valid health certificate,
   c) depending on the planned operation, have completed a training programme in operations based on the recommendations of the "Ship to Ship Transfer Guide", and
   d) have attended a suitable ship handling course focusing particularly on operations.
   e) be in possession of an appropriate anti-pollution training course certificate
4) When applying for approval as a service provider, documentation of compliance with the conditions stated in paragraph-1 shall be submitted to the Harbour Authority.
5) Approval shall be granted for a period of up to 3 years. The approval shall lapse if the conditions stated in paragraph-1 are no longer met. A certificate of approval from the Harbour Authority shall be issued to the service provider.
6) Portland Harbour Authority may request the latest SPSA audit from the service provider and evidence of external audit findings or may undertake a supplier audit based on the SPSA at the STS Operator's base.
7) The Harbour Authority may undertake random operational audits of ongoing transfer operations to verify compliance with paragraph-1 above.
8) The Harbour Authority may revoke an approval if an approved service provider participates in transfer operations in which the provisions of this order are grossly or repeatedly contravened.

4. Notification Requirements

Liquid Cargoes excluding substances Oil and Liquified Gases

Government authorities may require notifications for transfers involving Annex II cargoes. Where these transfers are conducted within port limits the harbour authority may require notification. In either case a lightering plan may be required. If alongside a terminal, the operator, or owner may also require a copy of the lightering plan.

Liquid Petroleum Gases

Government authorities require notifications for transfers involving Liquid Petroleum Gas cargoes on a case by case basis. Where these transfers are conducted within port limits the harbour authority may require notification. In either case a lightering plan may be required. If alongside a terminal, the operator, or owner may also require a copy of the lightering plan.

The approval must be displayed in the Cargo Control Room of the Mother vessel. Normally no other operations, e.g. bunkering. Stores etc. may be carried out concurrent with the Transfer operation,

Oil

For transfers involving MARPOL Annex I cargoes within the territorial sea or the Exclusive Economic Zone (EEZ) of a party to the MARPOL Convention, the Master or Agent of each tanker involved is required to notify the relevant Coastal State authorities not less than 48-hours in advance of the scheduled operation.

The Local Agent is responsible for notifying all concerned parties of the upcoming transfer operation in compliance with the MARPOL Convention.

Other cargoes

For transfer involving other cargoes, the service provider should check local and national regulations to determine the level of approval required to conduct the transfer operation.

5. Person in Overall Advisory Control (POAC)

Overview

Transfer operations within Portland Harbour are conducted under the co-ordination and advisory control of a suitably qualified and experienced Super intendent. This person will function as the Person in Overall Advisory Control (POAC). The role of POAC is described in the Ship to Ship Transfer Guide for Petroleum, Chemical and Liquified Gases as specific to the transfer of Oil, however Portland Harbour Authority require a POAC to be in place for all STS transfer operations regardless of cargo type.

Person in Overall Advisory Control (POAC)

In the case of Portland, a transfer operation should be under the advisory control of a designated mooring/unmooring Master, who will be a suitably qualified and experienced Superintendent. It is not intended that the POAC in anyway relieves the ships' Masters of any of their duties, requirements or responsibilities.

The POAC overseeing the transfer operation shall be qualified to perform all relevant duties, taking into account the qualifications contained in the best practice guidelines for STS operations identified by the Organisation. The Administration, cargo owners or oil tanker's operators should agree and designate the POAC who should have at least the following qualifications:

1. An appropriate management level deck license or certificate meeting international certification standards, with all STCW and dangerous cargo endorsements up to date and appropriate for the ships engaged in the transfer operation;
2. Attendance at suitable ship-handling course;
3. A knowledge of spill clean-up techniques, including familiarity with the equipment and resources available in the transfer contingency plan
4. Conduct of a suitable number of mooring/unmooring operations in similar circumstances and with similar vessels;
5. Experience in tanker cargo loading and unloading;
6. A thorough knowledge of the geographic transfer area and surrounding areas;
7. Thorough knowledge of the transfer plan (or STS Plan).

Responsibilities

During the transfer process the POAC is in charge of coordinating the transfer operation and is employed by the Service Provider. POACs ensure that the operation is conducted in a safe and controlled manner. They have the responsibility of ensuring the hoses are connected correctly and that safety devices are working properly.

The STS Service Provider provides all the relevant STS equipment (including fenders and hoses). STS equipment (including hoses) must comply with regulations and guidelines and be declared fit for purpose prior to the transfer process. They are also inspected during the transfer and after the transfer is complete. All staff carrying out the operation will have adequate training to perform the operation.

POACs must ensure that the following safety checklists are completed at the appropriate times:

- Before operations commence safety checklist.
- Before run-in and mooring safety checklist.

- Per-transfer conference safety checklist.
- Pollutions avoidance checklist.
- Before cargo transfer safety checklist.
- Before unmooring safety checklist.

Both ship' Masters retain their statutory responsibilities for the safety of their ship and the cargo. They remain in control and command of their own ships.

Portland Harbour Authority is responsible to advise of limiting weather conditions. OIC regulations state that transfer operations must be suspended when operational constraints are reached such as:

- Wind speeds
- Sea / swell wave heights
- Requirements for when cargo transfer operations shall cease requiring cargo hoses to be disconnected, and consideration given to unmooring the import and export vessels to separate anchorages until there is a moderation in the weather, when cargo operations can safely resume.

6. Equipment

Prior to starting the transfer operation, the Masters of the mother and daughter vessels should exchange information concerning the availability, readiness and compatibility of the equipment to be used in the operation.

Fenders

The vessels should be provided with fenders (primary and secondary). These fenders should be capable of withstanding the anticipated berthing energies and should be able to distribute the forces evenly over the appropriate area of the hulls of both oil tankers. It is recommended that fenders constructed to ISO 17357 should be used. Industry best practice is that the safety valve on pneumatic fenders is inspected at intervals not exceeding two years and a certificate provided to demonstrate this.

Hoses

The hoses used for the transfer of should be specially designed and constructed for the product being handled and the purpose for which they are being used. Hoses used should comply with EN1765 (or latest equivalent) with regard to specification for the assemblies and with BS1435 (or latest equivalent) and OCIMF guidelines with regard to their handling, inspection and testing. Hoses should bear the following durable indelible markings:

1) Hoses should bear the following durable indelible markings:
2) The manufacturer's name or trademark;
3) Identification of the standard specification for manufacture;
4) Factory test pressure (Note: equal to rated working pressure, maximum working pressure, maximum allowable working pressure);
5) Month and year of manufacture and manufacturer's serial number;
6) Indication that the hose is electrically continuous or electrically discontinuous, semi-continuous or anti-static; and
7) The type of service for which it is intended i.e. the type of liquid cargo being transferred.

7. Contingency Planning

Although transfer operations can be carried out safely, the risk of accident and the potential scale of the consequences require that organisers develop contingency plans for dealing with emergencies. Before committing to a transfer operation, the parties involved should carry out a risk assessment covering operational hazards and the means by which they are managed. The output from the risk assessment should be used to develop risk mitigation measures and contingency plans covering all possible emergencies and providing for a comprehensive response, including the notification of relevant authorities. The contingency plan should have relevance to the location of the operation and take into account the resources available, both at the transfer location and with regard to nearby back-up support.

Risk Assessment

Transfer operations should be subjected to a risk assessment, the scope of which should include confirmation of the following:

1) Adequate training, preparation or qualification of vessel's personnel;
2) Suitable preparation of vessel for operations and sufficient control over the vessel during operations;
3) Proper understanding of signals or commands;
4) Adequate number of crew assigned to controlling and performing transfer operations;
5) Suitability of the agreed transfer plan;
6) Adequate communications between vessels or responsible person(s);
7) Proper attention given to the differences in freeboard or the
8) listing of the vessels when transferring cargo;
9) The condition of transfer hoses;
10) Methods of securely connecting hose(s) to the vessel(s) manifold(s);
11) Recognition of the need to discontinue transfer when sea and weather conditions deteriorate;
12) Adequacy of navigational processes.

Shipboard Contingency Plans and Safety Management Systems

Vessels area required to have a variety of Contingency Plans and Safety Management Systems in place. These might include:

- Shipboard Marine Pollution Emergency Plan for Noxious Liquid Substances – a requirement from MARPOL Annex II for vessels certified to carry noxious liquid substances exceeding 150 gross tonnes
- Shipboard Oil Pollution Emergency Plan (SOPEP) - a requirement from MARPOL Annex I for oil tankers exceeding 150 gross tonnes and all vessels exceeding 400 gross tonnes
- Where there is a requirement for both these may be combined into a single Shipboard Emergency Plan (SOPEP)
- All commercial vessels are required by the International Safety Management (ISM) Code to have a Safety Management System (SMS) in place. The SMS ensures every vessel complies with the mandatory safety rules and regulations, and follow the codes, guidelines, and standards recommended by the IMO, classification societies, and concerned maritime organizations.

Harbour Authority Contingency Plan

- UK Ports are required to prepare an Oil Spill Contingency Plan by the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998 (amended 2015), which implements the International Convention on Oil Pollution, Preparedness, Response and Co-operation.

- Portland Harbour Authority has prepared a plan in accordance the 'Contingency Planning for Marine Pollution Preparedness and Response - Guidelines for Ports' issued by the Maritime and Coastguard Agency.
- The Harbour Authority has extended the scope of the Plan to include non-oil type pollution following the principals of the 'Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000.
- The Portland Harbour Oil Spill and Marine Pollution Contingency Plan, as it is named, identifies probable risk scenarios typical port operations, bunkering and transfer operations.
- The harbour authority has a contract with a specialist Tier 2 pollution response provider who can provide additional specialist capability in support of a response. This includes equipment, personnel and expertise in the event a pollution incident exceeds the harbour authorities' own capabilities.
- The harbour authority maintains equipment sufficient to deal with a Tier 1 pollution incident as detailed in the plan, and additional equipment that would be needed for a Tier 2 response.
- In updating the plan to include for non-oils this includes ensuring contract with Tier 2 provider is fit for purpose, inclusion of a tactical response plan for non-oils, purchase of additional equipment, training of harbour authority staff and familiarisation of Tier 2 provider with port specific transfer operations.
- In the event of an oil spill the location of the pollutant, type of oil, source, cause, extent and direction of movement will be reported to the Oil Pollution Officer. Depending on the tier of the spill, different response actions will be mobilised.
- If an accidental oil spill was to take place then application of the OSCP would considerably reduce the effects of a spill. It will minimise the scale and extent of an oil spill. Significant effects on the environment through marine pollution should be reduced to short- term manageable effects if the contingency plan can contain and minimise the scale of the spill and prevent any widespread impact.

8. Procedures for Transfer Operation

Preparation for Operations

Prior to the transfer operation, the Masters of both vessels and, the POAC, should make the following preparations before manoeuvres begin:

1. Carefully study the operational guidelines contained herein and in the industry publication 'Ship to Ship Transfer Guide', as well as any additional guidelines provided by the ship-owner and cargo owner;
2. Ensure that the crew is fully briefed on procedures and hazards, with particular reference to mooring and un-mooring;
3. Ensure that the vessels conform to relevant guidelines, is upright and at a suitable trim;
4. Confirm that the steering gear and all navigation and communications equipment is in satisfactory working order;
5. Confirm that engine controls have been tested and the main propulsion plant has been tested ahead and astern;
6. Confirm that all essential cargo and safety equipment has been tested;
7. Confirm that mooring equipment is prepared in accordance with the mooring plan;
8. Fenders and transfer hoses are correctly positioned, connected and secured;
9. Cargo manifolds and hose handling equipment is prepared;
10. Obtain a weather forecast for the transfer area for the anticipated period of the operation;
11. Agree the actions to be taken if the emergency signal on the oil tanker's whistle is sounded; and
12. Confirm completion of relevant pre-operational check lists.

Communications with the master of the vessels should be established at an early stage to co-ordinate the rendezvous and the method and system of approach, mooring and disengaging.

When the preparation of either vessel has been completed, the other vessel should be so informed. The operation may proceed only when both vessels have confirmed their readiness.

Transfer Operation

Prior to the proposed cargo transfer, a risk assessment is undertaken by OIC Harbour Authority. The risk assessment considers weather conditions, ballast water quantity, wind and tide conditions and cargo load.

Preparing vessels is summarised as follows:

- Anchoring of Mother vessel
- Mother vessel is securely anchored before the daughter vessel arrives.
- Fendering of vessels
- Fenders are secured in place, along the parallel body of one of the ships, to absorb energy as the vessels berth alongside each other.
- Manoeuvring of vessels
- Daughter vessel approaches mother vessel and is moved into position by OIC tugs.
- Mother vessel can be held in place or manoeuvred (weather vaned etc.) at discretion of the Master with assistance from the authorised Pilot to ensure that the berthing operation is completed in a safe manner.

Transfer of cargo is described as follows:

- Once the vessels are securely moored the transfer hoses are connected. Each end of the hose is secured to a ship's manifold using eight bolts. The connection is made in a catchment area so that any drips or minor spill arising during connection are collected onboard the ship and not released to the environment.
- During the transfer process tugs are on standby as required
- Once transfer is complete hoses are drained and blown through to clear them out and are then disconnected.

Unmooring and Departure is described as follows:

- OIC tugs assist with unmooring of vessels.
- OIC tugs manoeuvre the vessels to ensure safe separation
- OIC tugs escort the vessels out of the harbour waters, as per harbour regulations.

9. Planning of Transfer Operation

A Joint Plan of Operation in alignment with the Transfer plan established for each ship should be developed on the basis of information exchanged between the two vessels, including the following:

1. Mooring arrangements;
2. Quantities and characteristics of the cargo(s) to be loaded (discharged) and identification of any toxic components;
3. Sequence of loading (discharging) of tanks;
4. Details of cargo transfer system, number of pumps and maximum permissible pressure;
5. Rate of product transfer during operations (initial, maximum and topping-up);
6. The time required by the discharging vessel for starting, stopping and changing rate of delivery during topping-off of tanks;
7. Normal stopping and emergency shutdown procedures;
8. Maximum draught and freeboard anticipated during operations;
9. Disposition and quantity of ballast and slops and disposal if applicable;
10. Details of proposed method of venting or inerting cargo tanks;
11. Details of cargo washing, if applicable;
12. Emergency and spill containment procedures
13. Sequence of actions in case of spillage;
14. Identified critical stages of the operation;
15. Watch or shift arrangements;
16. Environmental and operational limits that would trigger suspension of the transfer operation and disconnection and unmooring of the tankers;
17. Local or government rules that apply to the transfer;
18. Co-ordination of plans for cargo hose connection, monitoring, draining and disconnection; and
19. Unmooring plan.

Of note prior to a transfer operation all relevant parties are involved in a pre-STS meeting to discuss and agree a STS plan. The meeting ensures all parties involved are fully briefed and in agreement on the following:

- Procedures relating to the operation.
- Indented sequence of events.
- Designated anchor position for the operation.
- Mooring configuration including fender positions.
- Tug deployment.
- Pollution response.
- Notification to statutory bodies.
- Notification to national authority i.e. MCA.
- Communication procedures.

Prior to the transfer taking place the STS Superintendent (provided by the STS agent) must ensure briefings are provided for the Masters and crew of the mother and daughter vessels.

10. Maintaining Records

Oil tankers exceeding 150 gross tonnes and all vessels exceeding 400 gross tonnes are required by Regulation 17 if MARPOL Annex I to keep an Oil Record Book. This records if any of the following occurs:

- ballasting or cleaning of oil fuel tanks;
- discharge of dirty ballast or cleaning water from oil fuel tanks;
- collection and disposal of oil residues (sludge and other oil residues);
- discharge overboard or disposal otherwise of bilge water which has accumulated in machinery spaces; and
- bunkering of fuel or bulk lubricating oil.

Chapter 8 of MARPOL Annex I which deals with Ship to Ship Transfer Operations requires that records of STS operations shall be retained on board for three years and be readily available for inspection by a Party to the present Convention.

Similar to the Oil Record Book, Regulation 15 of MARPOL Annex II requires that every ship to which Annex II applies, is required to maintain a Cargo Record Book in accordance with Appendix 2 of Annex II

11. Key Documentation

- International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, 2016 [IBC Code] (IMO)
- International Code for the Construction and Equipment of Ships Carrying Carrying Liquified Gases in Bulk, 2016 [IGC Code] (IMO)
- International Convention on Oil Pollution Preparedness, Response and Co-Operation, 1990
- Manual on Chemical Pollution - Section 1: Problem Assessment and Response Arrangements, 1999 Edition
- Manual on Chemical Pollution - Section 3: Legal and Administrative Aspects of HNS Incidents, 1997 Edition
- Manual on Oil Pollution - Section 2: Contingency Planning, 2018 Edition
- Manual on Oil Pollution - Section 4: Combating Oil Spills, 2005 Edition
- Manual on Oil Pollution - Section I: Prevention, 2011 Edition (IMO)
- Manual on Oil Pollution - Section V: Administrative Aspects of Oil Pollution Response, 2009 Edition
- Manual on Oil Pollution - Section VI: IMO Guidelines for Sampling and Identification of Oil Spills, 1998 Edition
- MARPOL Annex I – Regulations for the prevention of pollution by oil (IMO)
- MARPOL Annex II – Regulations for the control of pollution by noxious liquid substances (IMO)
- Merchant Shipping Act 1995
- MSN 1643 Prevention of Oil Pollution – Information on the schedules and regulations relating to the merchant shipping (prevention of oil pollution) regulations, 1996.]
- MSN 1703 Dangerous or noxious liquid substances – Schedules forming part of the merchant shipping (dangerous or noxious liquid substances) regulations, 1996
- MSN 1829 - Ship to Ship Transfer Regulations 2010/2012
- Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol)
- Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gases (OCIMF/ICS/SIGTTO/CDI)
- The Merchant Shipping (Dangerous or Noxious Liquid Substances in Bulk) Regulations 1996
- The Merchant Shipping (Gas Carriers) Regulations 1994
- The Merchant Shipping (Prevention of Oil Pollution) Regulations 2019
- The Merchant Shipping (Ship-to-Ship Transfers) Regulations 2020 - SI2010/1228

Appendix 3.3 –

Oil Spill Modelling Report

Coastal Science Ltd

A Report for

PORTLAND PORT

Portland Harbour Marine Modelling

Oil Spill Scenarios

Report R210301
March 2021

Title:	Portland Harbour Marine Modelling - Oil Spill Scenarios
Client:	Portland Harbour Authority
Report No:	R210301
Date of Issue:	March 2021
Level of Issue:	Final

Distribution:	Client	No: pdf
	Coastal Science	No:
Prepared By:	P Shepperd	
Signed		

Table of Contents

1 Background

Portland Port commissioned Coastal Science Ltd to undertake a modelling study of the potential impacts of an oil spill occurring during transfer operations at three locations within the Port Authority limits. Spill events occurring under a range of tidal and meteorological conditions needed to be considered in order to inform the Port's Oil Spill contingency planning.

The modelling study has involved the building of a new, bespoke, 2D model of Portland Harbour and the surrounding waters including Portland Bill, East Fleet and Weymouth Bay. The model operates in the Deltares Delft3D-4 software suite, which represents the state-of-the-art in terms of coastal modelling software. The model is dynamic, representing tidal and wind driven flows in a high level of detail, and fully resolving key features such as the harbour breakwaters. It also includes a well-established Oil Spill module.

A bespoke GNU OCTAVE code has also been developed and provided, allowing Portland port staff to easily interrogate the model outputs, and rapidly generate and view map images.

Given the model's high resolution, its well defined processes and its strong validation, the model outputs provide useful information regarding the behaviour of the simulated oil spills, and are sufficiently robust to inform the development of contingency arrangements for responding to an oil spill in connection with the proposed transfer operations at Portland.

The intention of this report is to describe how the model was constructed, calibrated and validated, and how the Oil Spills were simulated. It is not the purpose of this report to discuss the model output in detail; the output will instead be utilised by Portland Port as required.

Coastal Science Ltd

Coastal Science Ltd (www.coastalscience.co.uk) is an independent UK consultancy based in East Devon, whose specialist services can be summarised as:

- Modelling: Site Characterisation, Impact Assessment and Design Optimisation.
- Survey: Specification, Management and On-Site Client Representation.
- Consultancy: Water Quality, Hydrodynamics, Renewables.

Coastal Science has 23 years' experience of coastal modelling, including oil spill and other dispersion studies at numerous locations around the UK coastline and worldwide.

2 Project Requirements

It was required to model the fate of a number of substances following spillage from the following locations, marked on Admiralty Chart 2268:

- Portland Anchorage G6 (Outer Harbour)
- Portland Anchorage M6 (Inner Harbour)
- Queen's Pier

The following substances were to be modelled:

- Light Oil
- Medium Oil
- Heavy Fuel Oil
- Light Crude Oil
- Medium Crude Oil
- Heavy Crude Oil

Spills were to be of a uniform quantity (1,000 Kg), and to take place at High Water Springs and Low Water Springs.

Each of the 36 x oil type / location / tide scenarios (6 oil types x 3 locations x 2 tide times) were to be considered for appropriate 7 x agreed wind velocities, derived from the historical records, and noting the operation limits for transfer operations.

This leads to 252 scenarios, all written to "map" files of both floating and beached oil (as separate parameters) every 20 minutes for the 7 day simulation duration.

Presentation of this quantity information as an appendix to this report is not practical. Output files have therefore been provided to the client in MATLAB .mat format, and an accompanying bespoke GNU OCTAVE code has been developed and provided, allowing Portland port staff to easily interrogate the model outputs, and rapidly generate and view map images.

3 Model Build

Deltares' Delft3D-4 was selected for this study. Delft3D represents the state-of-the-art in terms of commercially available modelling software, offering high levels of flexibility and accuracy through a user-friendly interface. The Delft3D suite offers a range of hydrodynamic (2D and 3D), wave, sediment transport, advection, dispersion and water quality modelling tools. More information can be found here:

https://www.deltares.nl/en/software/delft3d-4-suite/

The Oil Spill module sits within of the D-PART particle tracking model. Processes that are included in the Oil Spill module include:

- Advection of floating oil by wind and currents
- Dispersion (entrainment in water) of oil induced by wind waves (based on wind speed and oil characteristics)
- Evaporation of floating oil
- Emulsification
- Decay
- Sticking of oil to the coastline or seabed.

The Oil Spill Module Conceptual Description, taken from the D-PART manual, is included at Appendix A.

The set-up of the Portland Coastal Model, comprising construction and validation, was as follows:

Boundary Data

Water level data to drive the models' open boundaries was derived from the Coastal Science English Channel Model (Figure 1), one of a number of regional models of the seas around the UK which have been developed by Coastal Science. The ECM has been used by Coastal Science to provide robust boundary data for a number of projects within the English Channel.

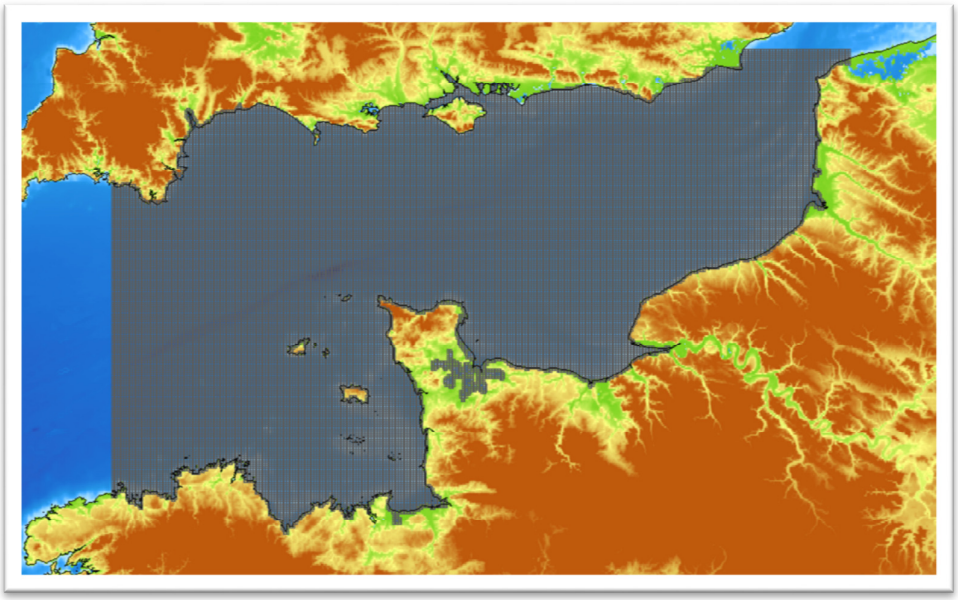


Figure 1 – The Coastal Science English Channel Model

Model Grid Development

Gridding is the process of dividing the model area into a large number of computational elements, or “cells” which conventionally are square. Correct gridding is important, since:

- It determines the resolution of the model, and hence (through controlling the fidelity of the representation of bed topography and structures, and the detail of the hydrodynamic flows) the model accuracy on a local scale.
- It drives the maintenance of computational efficiency

The selected approach was Curvilinear Gridding. This allows the normally square grid cells to become quadrangles, “moulded” to the coastal topography and focussed on the area of interest. The final Portland Coastal Model grid is shown in Figure 2.

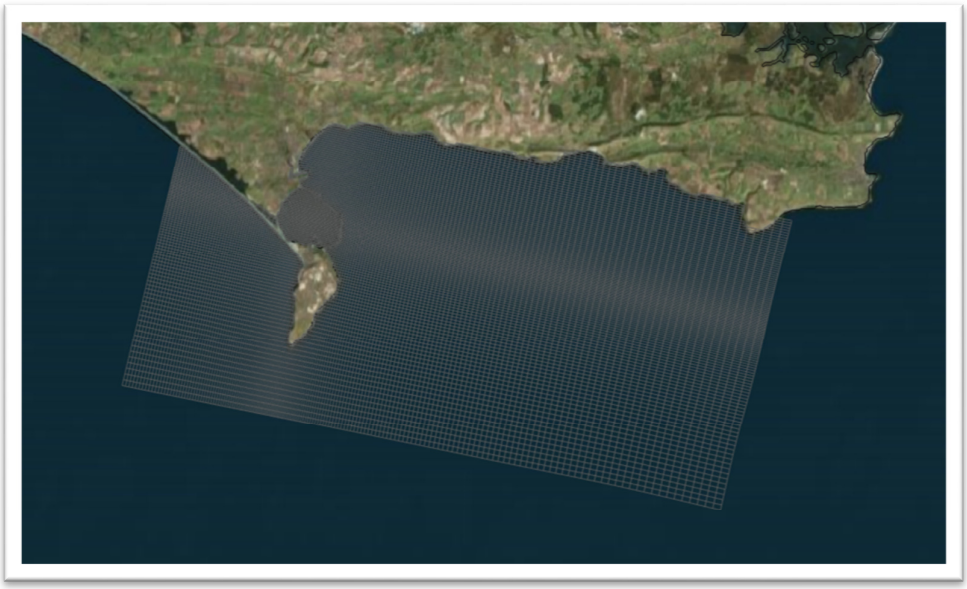


Figure 2– Portland Coastal Model Grid

A detail of the grid is shown in Figure 3. The North, East and South Ship Channels are correctly resolved in terms of width through adjustment of the local grid cells, as is Smallmouth Passage under Ferry Bridge, linking the harbour to East Fleet (also represented in the model).

The model was constructed with a resolution of at least 100m at the port and around the spill locations. The remainder of the model area was gridded with appropriate resolution reducing toward the open sea boundaries. Note that resolution refers only to the hydrodynamic model D-FLOW. D-PART and the Oil Spill module that sits within it are both independent of the hydrodynamic grid, i.e. they operate on a sub-grid scale.

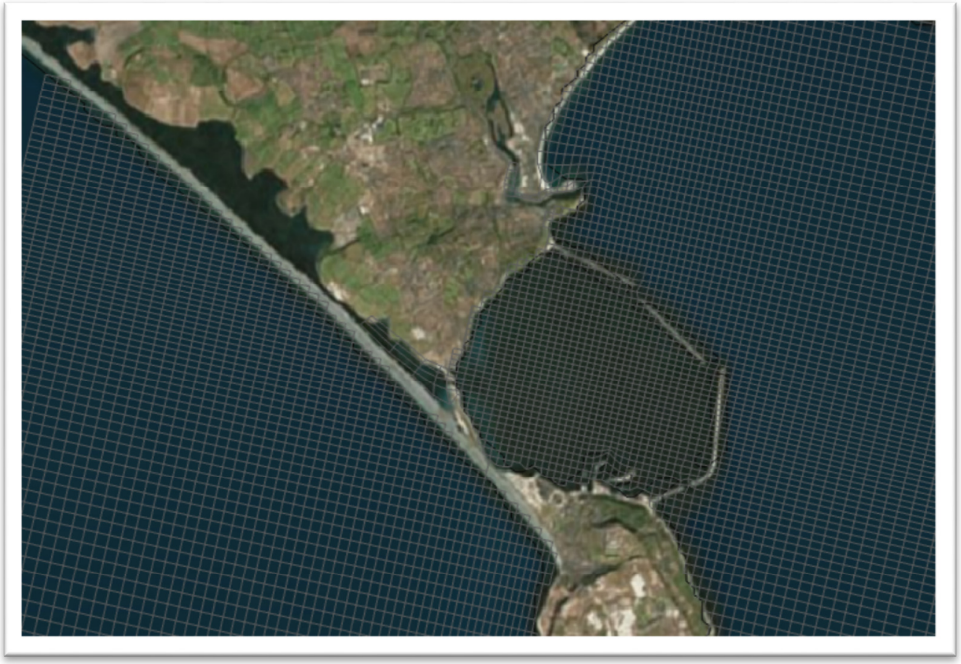


Figure 3 – Portland model Grid (detail)

Datums & Bathymetric Data

Model vertical datum was defined as Mean Sea Level and that horizontal datum was British National Grid.

Bathymetric data – representing the topography of the sea bed – was interpolated from UKHO data available through the Inspire portal, and data available from the Channel Coastal Observatory. UKHO datasets are to LAT, which is spatially highly variable and was converted to Mean Sea Level using the UKHO Vertical Offshore Reference Framework (VORF) conversion.

Model bathymetry is shown in Figure 4.

Bed Roughness

Adjustment of the bed roughness parameter was a primary means of model calibration; a uniform value of 0.02 s $m^{-(1/3)}$ (Manning) was arrived at during the calibration process.

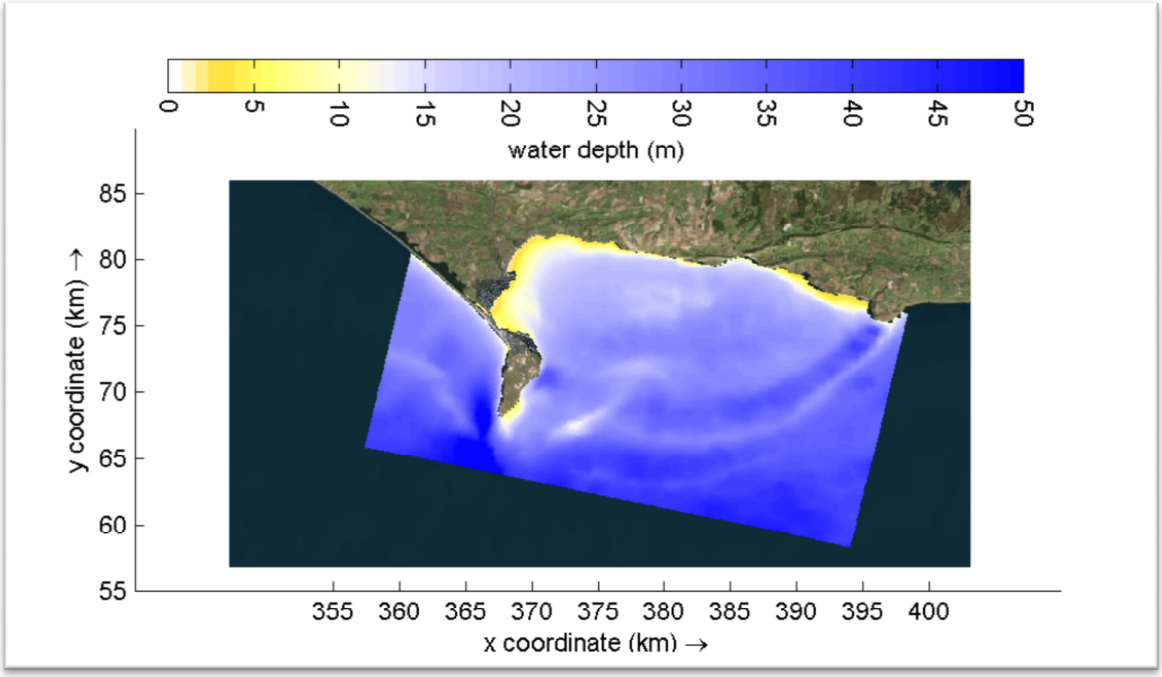


Figure 4 – Model Bathymetry (m MSL)

Vertical Dimensions & Wind

The hydrodynamic model D-FLOW was configured in depth averaged (2D) mode, considered appropriate to the present study. Wind was included in the D-FLOW simulations.

D-PART is a 3D-model in which a 3D hydrodynamic flow field is obtained by superimposing a logarithmic velocity profile over depth on the 2D D-FLOW simulation outputs, and a parabolic profile over depth for wind.

4 Model Calibration & Validation

Model calibration and validation was carried out against the following datasets, in order:

- Calibration against measured water levels at Queen's Pier, as provided by Portland Port
- Validation against IHO / UKHO Tidal Diamond data for 4 key sites

Calibration was primarily carried out by iterating changes to the open sea boundary conditions until optimally configured, and then by adjustment of the bed roughness parameter in the model. Validation then served as a confirmation of model accuracy without further adjustment of model parameters.

Water Level Calibration

Calibrated model water level predictions at Portland are presented against measured data in Figure 5. The measured data was at times noticeably affected by meteorology; the time frame presented here was selected for being a period of relatively clean tidal signal, thus removing the need for performing harmonic frequency analysis on the data to remove non tidal effects. The calibrated model is shown to be reproducing the complex tidal curve at Portland with a good degree of accuracy. The spring tide double low water in the measured data appears in the model as a stand shortly after the Commencement of Rise; this slight difference is not significant to the present study.

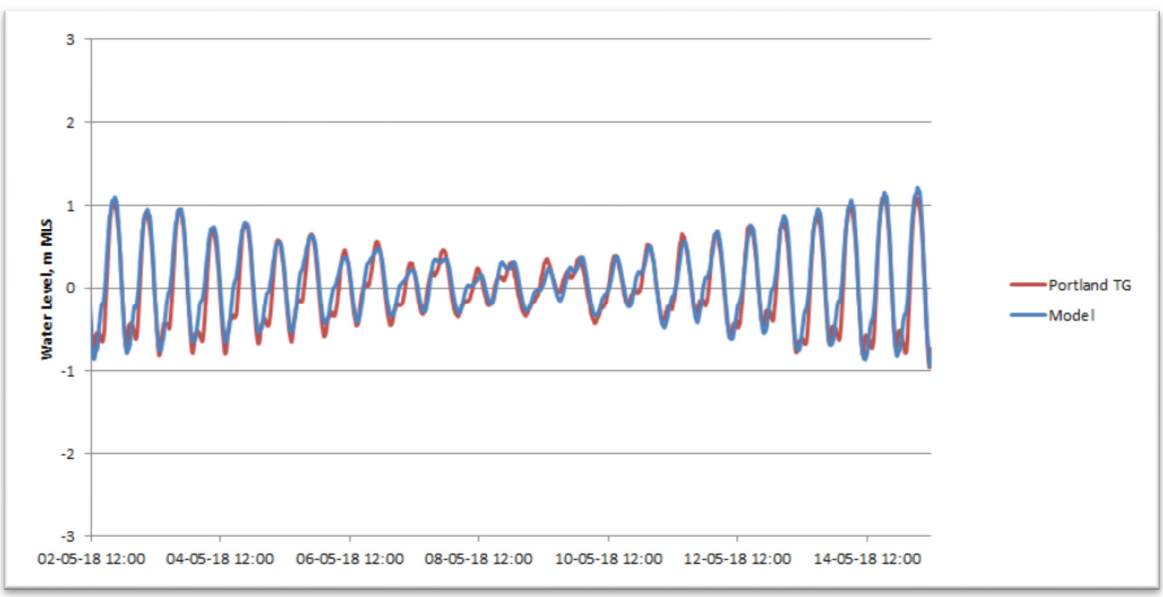


Figure 5 – Water levels at Portland Port

Tidal Streams Validation

Validation of model tidal stream predictions was carried out against UKHO Tidal Diamond datasets for 4 key locations, as shown in Figure 6.

Figure 6 – Tidal Diamond locations

The provenance – date, acquisition methodology, weather conditions - of Tidal Diamond data is not available, and often the data may be 19th Century and gathered by log-and-line methods. For these reasons it is not suitable for model calibration, but provides a useful validation tool if treated with caution. Data is usually gathered on a spring tide (range not published, but not necessarily mean spring), and then a simple factor applied to provide neap tide predictions for use on Admiralty Charts. Model validation was carried out for a mean spring tide.

Validation plots for SN003AO, SN003AI, SN003AP and SN003AU are shown in Figure 7 through to Figure 10.

In all cases, the correlation between model and Tidal Diamond data confirms that the model predictions of tidal flows in the study area are essentially correct, both in terms of flow speeds and the direction of flow throughout the tidal cycle.

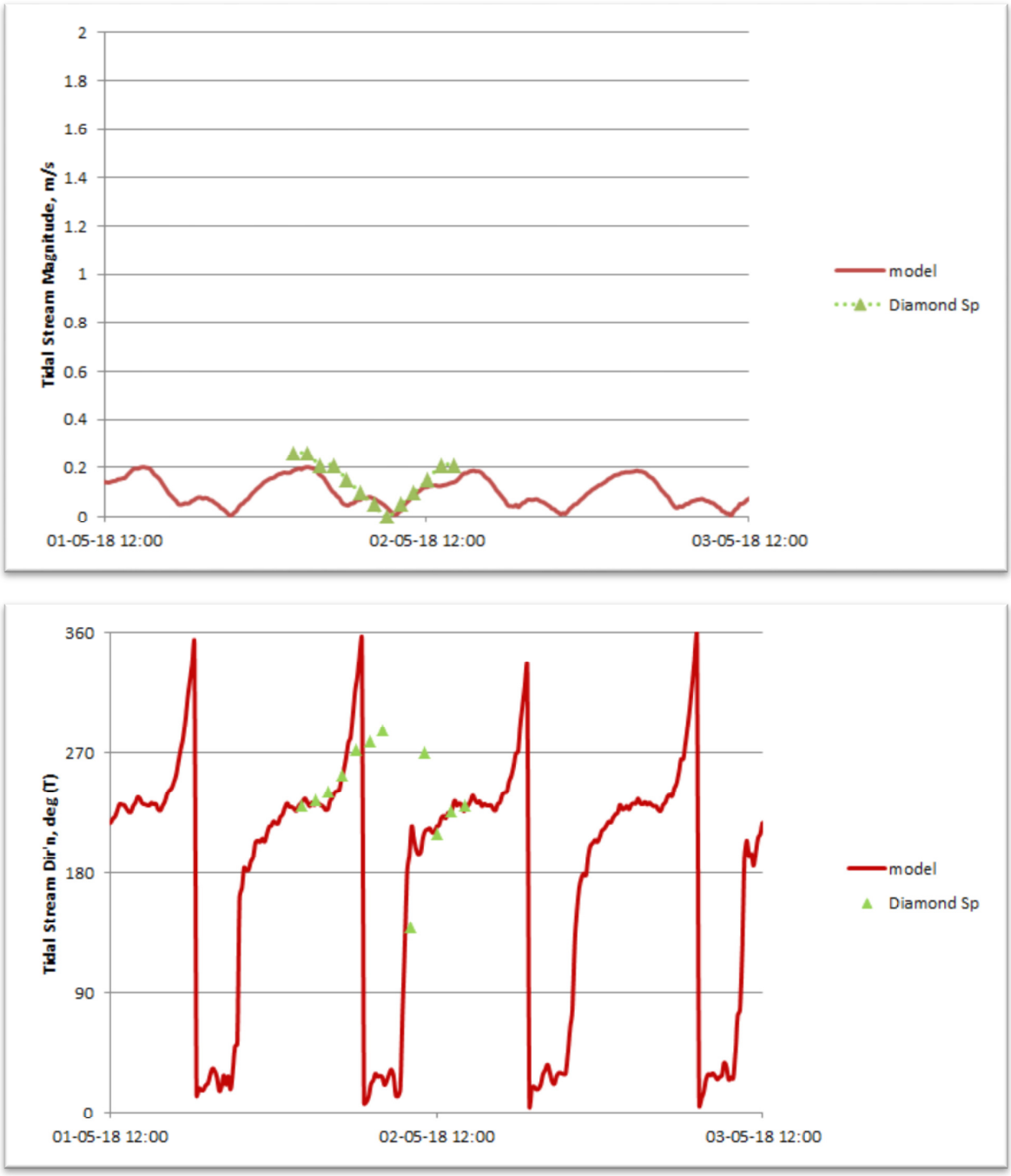


Figure 7 – SN003AO Validation. Tidal Stream Magnitude (top) and Direction (bottom)

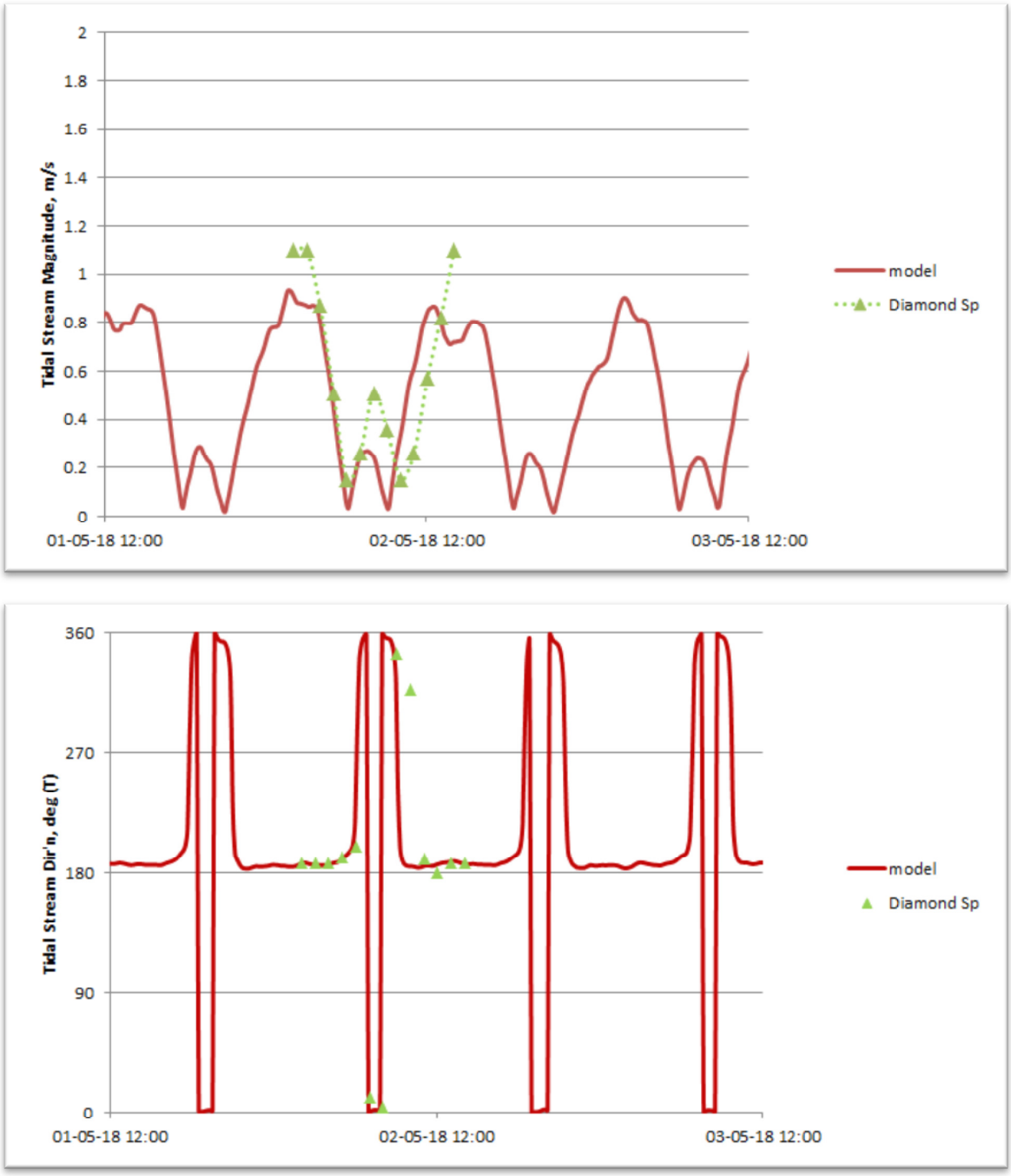


Figure 8 – SN003AI Validation. Tidal Stream Magnitude (top) and Direction (bottom)

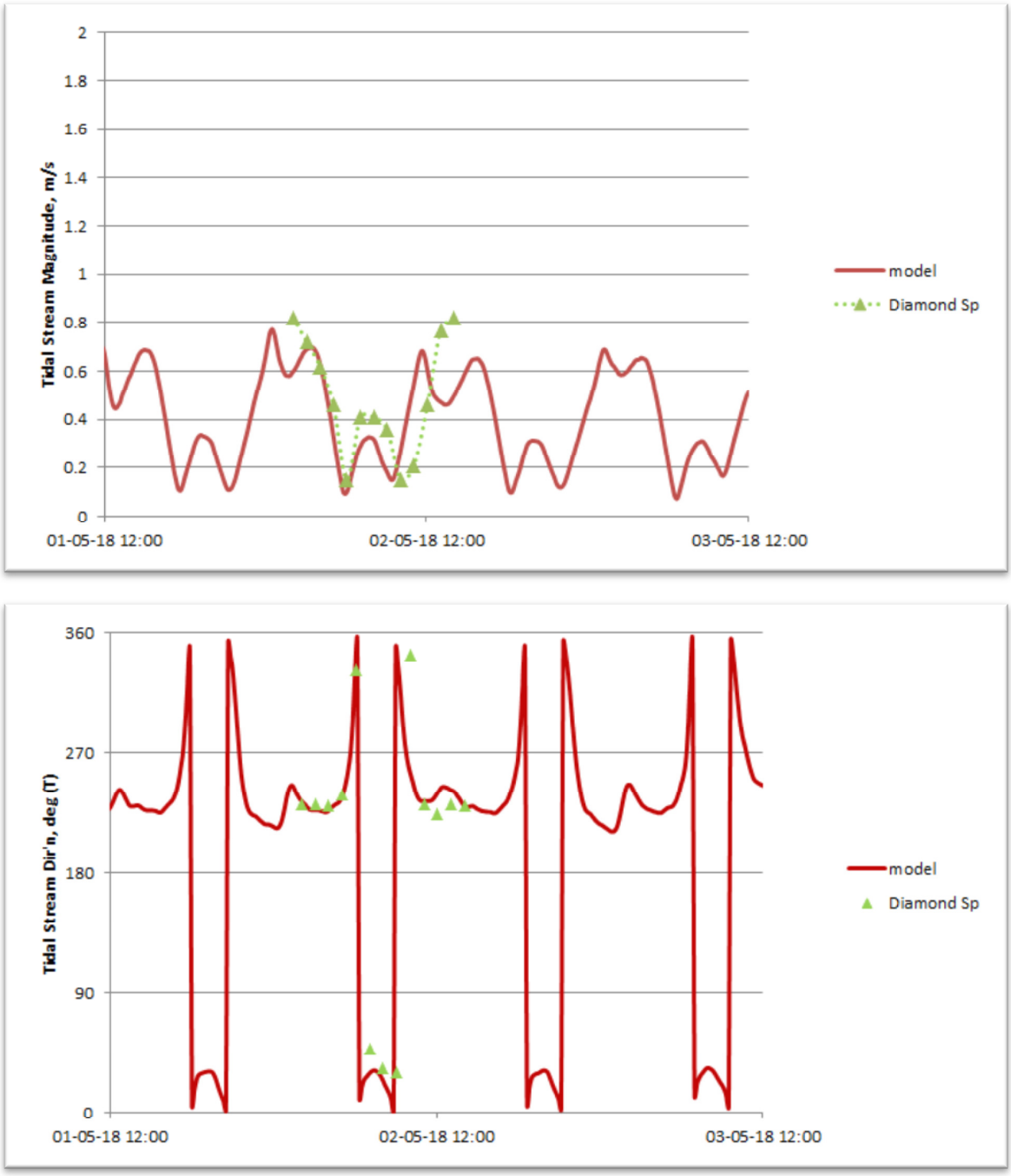


Figure 9 – SN003AP Validation. Tidal Stream Magnitude (top) and Direction (bottom)

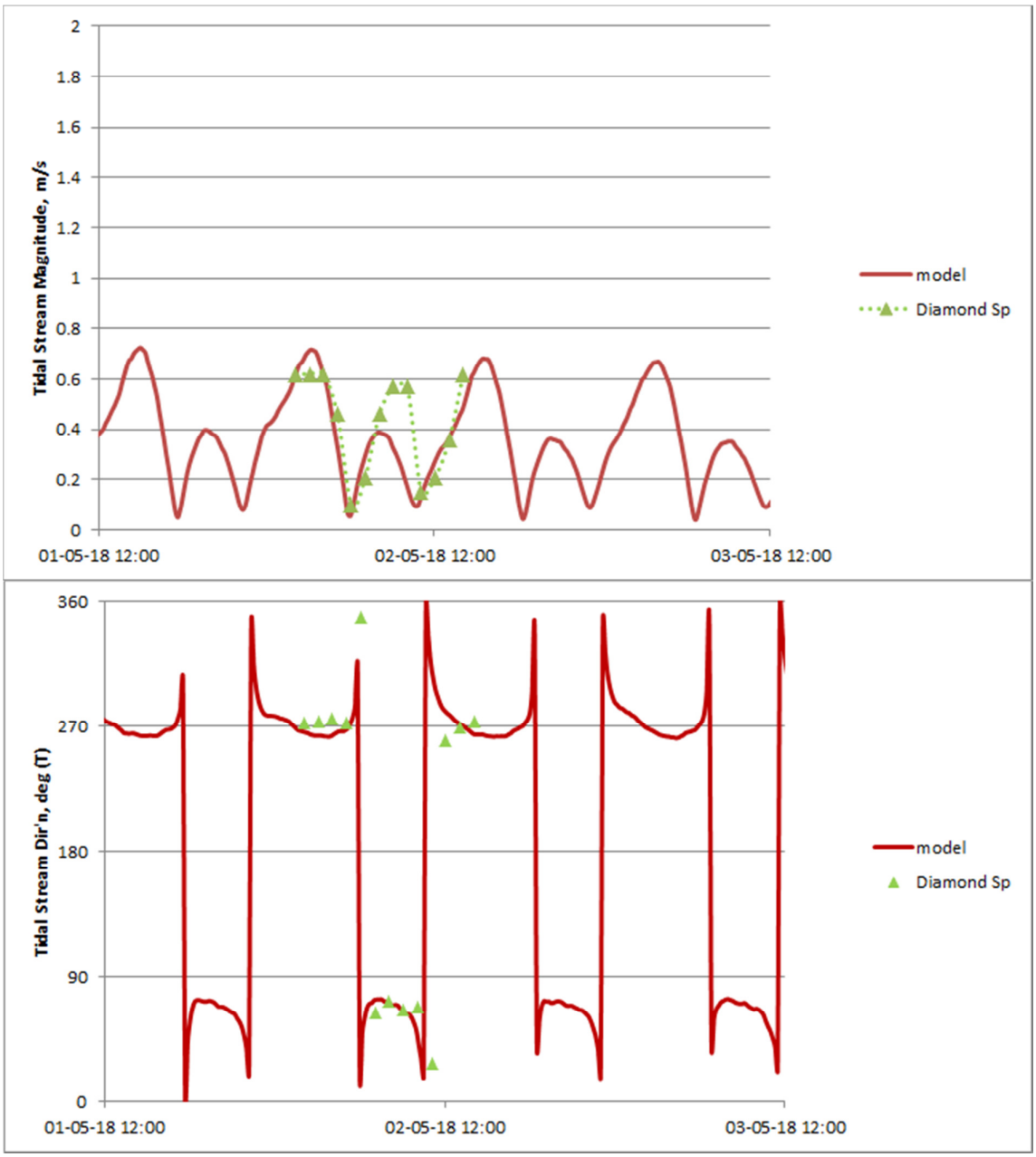


Figure 10 – SN003AU Validation. Tidal Stream Magnitude (top) and Direction (bottom)

5 Model Application

The following oil fractions were modelled:

- Light Oil
- Medium Oil
- Heavy Fuel Oil
- Light Crude Oil
- Medium Crude Oil
- Heavy Crude Oil

Details of each oil, in terms of required model input parameters, are in Table 1. These were agreed with Portland Port prior to model application. The crude oil density and viscosity parameters were determined in the context of oil types that are expected to be commonly handled at Portland, such as Brent and Forties (light crudes), Urals and Forcados (medium crudes) and Kraken and Captain (heavy crudes). For other parameters and other oil types, values were taken from the Danish Hydraulic Institute Oil Spill Template (*DHI, 2017*) or from the D-PART Oil Spill manual as appropriate.

Model Parameter	Light Oil	Medium Oil	HFO	Light Crude	Medium Crude	Heavy Crude
Initial Density Kgm^{-3}	813.1	859	994.2	803	870	953
Kinematic Viscosity cSt	1.62	1.68	209	4.47	12.73	382.105
Evaporation 1 day^{-1}	22.5	10	5	5	5	5
Stickyness probability	0	0	0.5	0.5	0.5	0.5
Volatile fraction	0.729	0.3	0.075	0.08	0.08	0.08
Emulsification parameter	2E-6	2E-6	2E-6	2E-6	2E-6	2E-6
Max water content	0.5	0.5	0.85	0.85	0.85	0.85
Fraction at which Emulsification starts	0.1	0.1	0.05	0.05	0.05	0.05

Table 1 – Oil Parameters

Spills were instantaneous, at High Water (mean spring) or Low Water (mean spring) and were all of 1000 kg. The initial radius of the patch is calculated by the model, which assumes the "gravity inertial" phase (typically around 5 minutes in duration) has been completed. All simulations ran for 7 days, from the mean spring tide of the release events, through to the subsequent neap tide.

Spills were modelled at the following locations, as marked on Admiralty Chart 2268:

- Portland Anchorage G6 (Outer Harbour)
- Portland Anchorage M6 (Inner Harbour)
- Queen's Pier (Inner Harbour at Commercial Port)

Each of the 36 (6 oil types x 2 tide times x 3 locations) scenarios were modelled for a "no wind" condition plus 6 agreed wind velocities, derived from the historical records (Nov 2017 to Nov 2020) measured at the NE breakwater, processed and provided by Portland Port. The historical records are summarised in the Wind Rose in Figure 11.

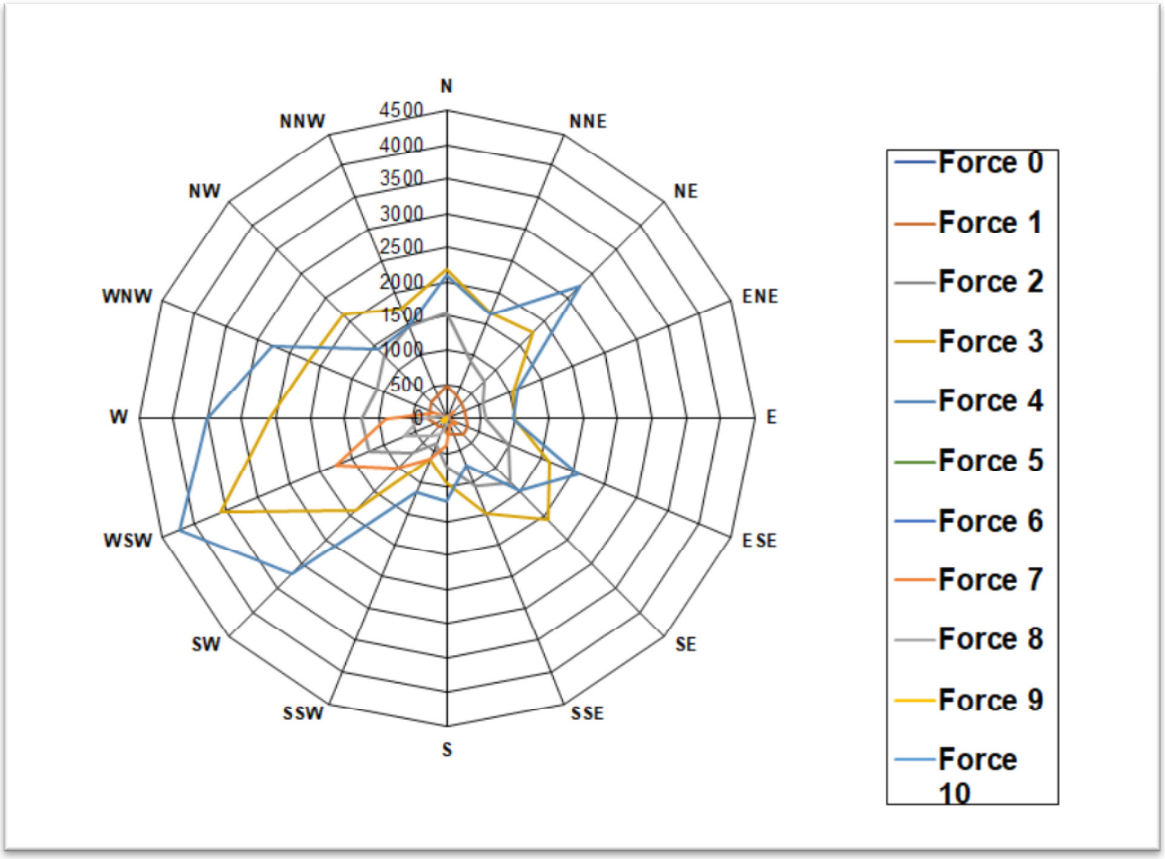


Figure 11 – NE Breakwater Wind Rose

The wind velocities agreed for the model scenarios are as follows:

- No Wind
- WSW Force 4
- WSW Force 6
- SW Force 4
- W Force 4
- ESE Force 4
- NE Force 4

… where Force 4 was taken as 7 ms^{-1} and Force 6 was taken as 12 ms^{-1}

The 7 x wind velocities result in 252 oil spill scenarios being modelled.

Default wind drag coefficients were applied to the D-FLOW hydrodynamic simulations. These values are based on extensive research by model developers at Deltares, and experience suggests that this approach is valid in most situations.

The hydrodynamic model was the run for the spring-neap timeframe for each of the wind velocities above. The hydrodynamic outputs for each simulation were written to a database every 20 minutes, and subsequently called by the D-PART model to provide hydrodynamic forcing to the Oil Spill simulations.

The recommended wind-drag coefficient for D-PART oil spill simulations is 3%, and this value was applied. The integral over depth is zero and is superimposed on the normal hydrodynamic velocity profile which already includes the gross average influence of the wind.

The Delvigne Sweeeny dispersion formulation was selected. See Appendix A – Conceptual Description.

6 Results

Model output was written to “map” files as both floating oil and “sticking” i.e. beached oil.

Output was written to the map files every 20 minutes of the spring-neap simulation timeframe.

In order to enable Portland Port to make the best use of this extensive output, the output files were written to MATLAB .mat format. A bespoke code was written for Portland Port, for use in GNU OCTAVE[1], allowing port staff to easily interrogate the model outputs, and rapidly generate and view map images such as the example one shown in Figure 12 (showing the oil patch 2h 20m after a spill from Anchorage M6, under westerly wind conditions).

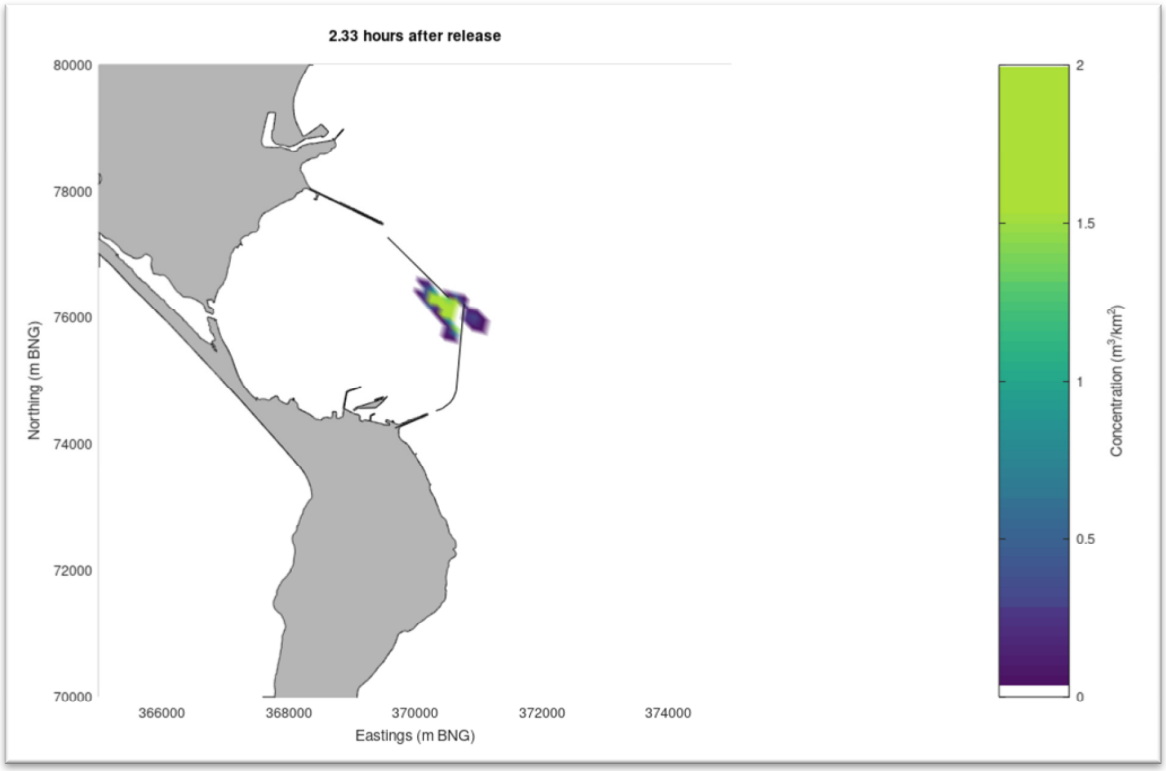


Figure 12 – Example Octave Map output

[1] GNU Octave is software featuring a high-level programming language, primarily intended for numerical computations. Octave is also useful for performing other numerical experiments using a language that is mostly compatible with MATLAB. It may also be used as a batch-oriented language

There are some points to keep in mind when viewing and utilising the Octave maps:

- The minimum threshold value for displaying oil in the maps is 0.04 m^3 km^{-2}, a reflection of the Bonn Agreement Oil Appearance Code found here https://www.bonnagreement.org/publications. Model output units are kg m^{-2}, necessitating a conversion involving the oil density. While oil density is defined at the moment of spillage, it changes through the simulation. For the purposes of the conversion, a density of 950 kg m^{-3} has been assumed. Note that this assumption is only for plotting purposes, and does not affect the processes being modelled.

- The Floating Oil and concurrent Sticking Oil outputs are combined in the maps. The difference is clear when stepping through the maps in time-order, and interpretation of the maps is straightforward.

- As will be seen when viewing the maps, wind plays a dominant role in the advection of the spill in locations – such as inside the harbour – where tidal flow is weak. Tidal flow becomes stronger elsewhere, but wind continues to be highly significant. Spills took place on a mean spring tide; spills on neaps will be even more wind influenced.

- The movement of substances in water contains a random element. In order to model this, D-PART module is a stochastic model which is based on the principle that substance movement can be described by a limited but large number of discrete particles (in this case, 180,000 per spill) that are subject to advection due to the currents and by horizontal and vertical dispersion. The movement of the particles consists therefore of two elements. For each simulation time-step the first element is the advection step due to the shear stresses from currents (bottom) and wind (surface). The second element is a random walk step in which the size and direction of the movement is a random process but is related to the horizontal and vertical dispersion.

- In addition, all model simulations are representations of a highly complex system and contain a degree of error and uncertainty. For example, a spatially uniform steady wind speed has been applied to the spill simulations, which is unlikely to occur in reality due, for example, to topographical effects.

The OCTAVE maps, therefore, provide useful information regarding the behaviour of the simulated oil spills, and – given the model's high resolution, its well defined processes and its strong validation - are sufficiently robust to allow for the development of response plans while keeping in mind the points introduced above.

7 Conclusions

A bespoke Delft3D D-FLOW hydrodynamic model of Portland Harbour and surrounding waters has been constructed, with resolution of better than 100m in the area of interest and with the harbour walls and relevant channels correctly represented.

The Portland Hydrodynamic Model has been sufficiently calibrated against water level data, and validated against available tidal flow information.

The hydrodynamic model has then been used to drive an Oil Spill model using Delft3D D-PART. A number of wind conditions have been considered.

The Portland Oil Spill model has been applied to consider a range of 252 spill scenarios, including 6 oil types, 7 wind conditions and 3 spill locations. All spills are modelled as occurring at HW and LW on a mean spring tide.

Outputs generated by the Portland Oil Spill Model, generated every 20 minutes throughout each simulation, have been provide to Portland Port in .mat format. A bespoke GNU OCTAVE code has also been provided, allowing Portland port staff to easily interrogate the model outputs, and rapidly generate and view map images.

It is clear from the outputs that wind speed and direction plays an important part in determining the behaviour of the oil patch.

Given the model's high resolution, its well defined processes and its strong validation, the model outputs provide useful information regarding the behaviour of the simulated oil spills, and are sufficiently robust to inform the development of contingency arrangements for responding to an oil spill in connection with the proposed transfer operations at Portland.

Appendix A

Oil Spill Module Conceptual Description

6.5 Oil spill module

The Delft3D-PART Oil Spill model calculates the transport, spreading, evaporation and dispersion of an oil patch. Transport is either 2D or 3D. Oil can either be floating on the water surface, or it can be transported as a dispersed phase in the water column. Oil dispersion, also referred to as entrainment, is generated by breaking waves (due by wind) according to a formulation of Delvigne *et al.* (1986). Evaporation is based on a simple first order decay process.

Release of oil

Oil can be spilled as an instantaneous release or as a continuous release. The radius of an instantaneous release may follow from the standard input menu of the release, but may also be specified by the following formulation (Fay and Hoult, 1971):

$$R_0 = \frac{k_2^2}{k_1}\left(\frac{V_0^5 g\left(\frac{\rho_w-\rho_0}{\rho_w}\right)}{\nu_w^2}\right)^{1/12} \tag{6.17}$$

with:

V_0	initial volume of the oil spill [m^3]
ρ_0	oil density [kg/m^3]
ρ_w	density of water [kg/m^3]
g	gravity constant
ν_w	kinematic viscosity of water [10^{-6} m^2/s]
k_1,k_2	constants of Fay (1.14 and 1.45)

You should specify the oil density ρ_0 as input. The radius describes a patch after the so-called 'gravity inertial phase' which lasts in the order of 5 minutes for most spills. The thickness of the floating patch is then usually less than 1 mm. It is not recommended to use this description for continuous releases, but to specify the radius of the release according to the information that is available.

Wind induced advection of surface oil

The advection of surface floating oil is subject to wind effects. This is widely published in literature. For example, Labelle and Johnson (1993) carried out simulations of oil-spill trajectories for which each trajectory was constructed using vector addition of the current field and 3.5 percent of the instantaneous wind. A drift angle was computed as a function of wind speed (inversely related to wind speed). In a review by the Task Committee on Modelling of Oil Spills of the Water Resources Engineering Division (1996), it has been reported that the majority of spill models use a simplified linear superposition technique to approximate spill motion. The currents induced by winds and waves are normally lumped together and represented by an empirically based drift factor and deflection angle dependent on the local wind speed and direction. Drift speeds typically vary from 2.5–4.4% of the wind speed. The deflection angles vary between 0 and 25 degrees to the right/left of the wind direction (northern/southern hemisphere). The most detailed description of drift of oils is given by Yousseff and Spaulding (1993). Here also the drift speed is specified as typically between 2.5 and 4% of the wind speed with a mean value of

3.5%, and deflection angles between 0 and 25 degrees, with a mean of 15 degrees. Yousseff and Spaulding (1993) deal in detail with the effects of waves on the transport.

A representation of the effect of wind in Delft3D-PART is implemented for oil. For a reasonable behaviour of surface floating oil under windy conditions, it is essential for the wind to affect the advection of the surface floating oil. The most important effect is drift as a percentage of the wind speed. The relationship that describes this effect is specified as

$$C_{wd}(V_w - V_f) \tag{6.18}$$

with C_{wd} the wind drag, V_w the wind speed and V_f the current speed. This relationship is only applied to surface floating oil because the dispersed oil will be transported correctly by the currents of the hydrodynamic model and not be directly influenced by wind.

Another factor that affects the transport of the oil is governed by the aforementioned deflection angle, which is an angle between the wind direction and oil advection. This is essentially caused by the fact that the effects of the waves is under the influence of Coriolis and that the wave induced transport is at an angle of the wind. This angle is an empirical parameter. This parameter is chosen to be a constant and it is therefore assumed that the angle does not depend on the wind speed. The deflection angle will depend on the latitude. The deflection angle is included in the PART model as an additional parameter. The deflection angle would therefore essentially be a calibration parameter, depending on latitude and wind strength.

The drift of the surface oil is implemented in the 3-dimensional mode. When the flow is in a 2D mode, the advection by wind drift at the surface is included in the vertical profile that is derived in Delft3D-PART (see Section 6.4), thus an additional wind drift is not required.

Evaporation of oil

Evaporation of floating oil is implemented as a first order decay process. Decay can be specified by a decay constant as usual in the menu of process parameters (this can be done with a time-series), or by defining a fixed fraction of oil that decays each day.

It is known that oil contains fractions that do not evaporate. For example, Reed (1989) adopted in his model a mass transfer coefficient that uses the molecular weight of the volatile fraction of the oil spill.

In the oil module of PART, a volatile fraction has been introduced, albeit simplified compared with the implementation of Reed (1989). It is assumed that the volatile fraction F_{vol} evaporates as a first order process (i.e. exponential), and that the non-volatile fraction does not evaporate at all. This is achieved by the introduction of the following:

$$\frac{dF_v}{dt} = -\left(\frac{F_{vol} - F_v}{1 - F_v}\right) k \tag{6.19}$$

Where F_v is the evaporated fraction and k the evaporation rate constant. The numerator in the equation should always be positive and if $F_{vol} - F_v < 0$ then the evaporation is set to zero.

The oil viscosity will change during the evaporation process. In the literature, descriptions of the dependency of the viscosity as a function of the evaporated fraction exist and is generally given as:

$$\eta = \eta 0 e(C_v F_v) \tag{6.20}$$

This equation is given for the dynamic viscosity. Assuming that the density is approximately constant throughout the simulation, then the same function can be used to describe the kinematic viscosity. Reed (1989) states that the value of C_v in his model is equal to 1 for gasoline, kerosene and light diesel fuel and 10 for other petroleum products. In the PART model, this is implemented by assuming that C = 1 is used for light oils (kinematic viscosity less than 500 cSt) and C = 10 for the heavy oils (viscosity greater than 500 cSt).

Dispersion (entrainment) of oil

Dispersion of floating oil, or entrainment of oil in water, is implemented as a zero order decay process, i.e. the entrainment rate is independent of the floating oil concentration. The dispersion rate of oil depends only on the wave energy that is dissipated by the patch, and the type of oil.

The dispersion rate Q [kg/(m²/s)] of oil is given (see Delvigne and Sweeney (1988); NOAA (1994); Delvigne and Hulsen (1994)) by:

$$\begin{aligned}
Q &= \int_{d_{\min}}^{d_{\max}} Q(d)\ \mathrm{d}d \\
Q(d) &= C'' D_e^{0.57} F_{wc} N(d) d^3 \\
N(d) &= N_0 d^{-2.3} \\
D_e &= 0.0034 \rho_w g H_0 / \sqrt{2} \\
H_0 &= \frac{0.243 U_w^2}{g} \\
F_{wc} &= \frac{f_w}{t_p} \\
t_p &= 8.13 \frac{U_w}{g} \\
f_w &= \max(0.0, 0.032(U_w - 5.0))
\end{aligned} \tag{6.21}$$

with:

Q	dispersion rate [kg/(m²/s)]
$Q(d)$	dispersion rate per unit of diameter for droplets of diameter d [kg/(m²/s)]
d	oil droplet diameter [m]
$d_{\min}$	minimal oil droplet diameter [m]
$d_{\max}$	maximal oil droplet diameter [m]
C''	oil constant (calibration parameter, depending on kind of oil)
$N(d)$	oil particle size distribution function
N_0	normalisation constant distribution function
D_e	dissipation of wave energy per unit surface area [J/m²]

F_{wc}	number of waves that break per wave period [-]
t_p	peak wave period [s]
U_w	wind speed [m/s]
f_w	fraction of sea covered by white caps [-]

Here, white capping is formulated according to Holthuijsen and Herbers (1986) with the initial wind speed for white capping equal to 5 m/s. The minimal droplet size $d_{\min}$ can be taken zero as a good approximation. The crux is knowledge of parameters $d_{\max}$, N_0 and the calibration constant C''.

According to NOAA (1994), after resurfacing of particles back into the oil slick, $d_{\max}$ can be taken equal to 70 microns. In this approximation, it is assumed that after each breaking wave a quasi-steady state distribution of droplets results, i.e. the resurfacing of particles back into the oil slick due to buoyancy goes fast compared with the dissipation of wave energy by the oil slick. Defining a new calibration constant C_0 the following expression results for Q:

$$Q = 5.08 \cdot 10^{-8} C_0 S_{\text{cov}} D_e^{0.57} F_{wc} \tag{6.22}$$

with

Q	dispersion rate [kg/(m²/s)]
C_0	oil constant (calibration parameter)
S_{cov}	proportion of the sea surface covered by the oil in the relevant area
D_e	dissipation of wave energy per unit surface area [J/m²]
F_{wc}	number of waves that break per wave period [-]

The calibration parameter C_0 depends on the kind of oil: oil with a high viscosity disperses hardly for a wind speed of 10 m/s whereas oil with a low viscosity disperses fast for such a wind speed.

An order of magnitude of C_0 follows from Delvigne and Hulsen (1994) (Table 2 and Figure 4 of that publication). Since Delvigne and Hulsen do not take into account a steady state assumption their values can only be a first estimate for Delft3D-PART. Estimates of the dispersion constant C_0 are:

$C_0 \approx 2000$ for Ekofisk with standard oil viscosity $\nu = 8$ cSt (at 20 °C)

$C_0 \approx 50$ for Heavy Fuel Oil with standard oil viscosity $\nu = 3000$ cSt (at 20 °C)

Since viscosity is temperature dependent C_0 depends both on oil type and on temperature. Temperature dependence may be neglected for low viscous oils with $\nu < 100$ cSt (Delvigne and Hulsen, 1994).

Delvigne and Hulsen (1994) have shown that there is a relationship between the C_0 and the oil viscosity. Since viscosity is an oil characteristic and used as input of the model, this relationship is included in the model. The relationship used in the modified PART(Oil) model

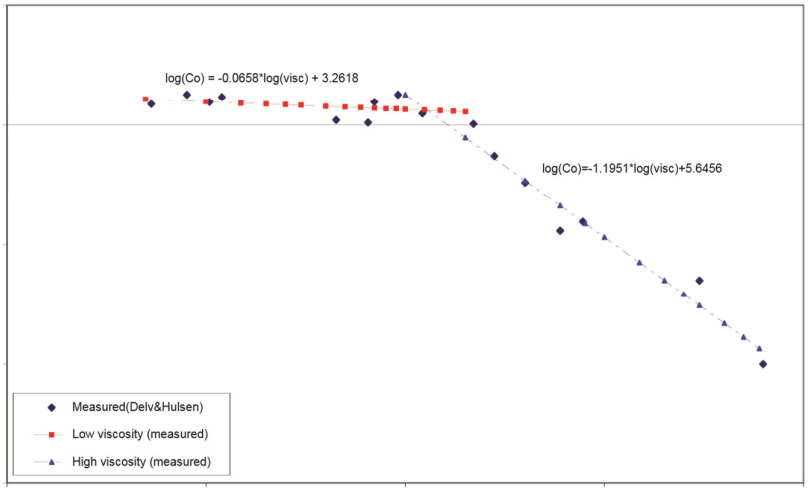


Figure 6.2: Relationship between viscosity and the dispersion parameter C_0 (Delvigne and Hulsen, 1994)

is based on the data published by Delvigne and Hulsen (1994). The data was examined and a log-log plot revealed that this relationship can be specified by two equations (Figure 6.2). The equations used and the goodness of fit with the data are indicated in the figure.

In order to calculate the entrainment flux, some representation of surface area for each surface oil particle is required. In the oil module an area for each particle is derived, based on the mass of surface oil associated with this particle (WL | Delft Hydraulics, 2003). This is calculated using an assumed oil layer thickness. Validation with the oil budget model ADIOS has resulted in an optimal value of 0.00005 m. This value of 0.05 mm (50 μm) is also similar to the value of 70 μm generally used to define the oil droplets that remain in suspension.

Emulsification

Water-in-oil (w/o) emulsions form a viscous cream, or floating, coherent semi-solid lumps, often called *chocolate mousse*. The process depends on oil composition. The formation of w/o emulsions reaches a maximum between 10 and 100 hours (Wheeler, 1978). The emulsification process itself is relatively rapid. It has been reported that emulsification takes place fully in the laboratory in 0.1–3 hours (Fingas *et al.*, 1999).

Emulsification is virtually an irreversible process (Wheeler, 1978) and changes the liquid to a heavy, semi-solid material (Fingas and Fieldhouse, 1996) with a high viscosity. Viscosity can be as high as $4 \cdot 10^6$ cP (Bos, 1980).

The emulsification process is implemented in PART following the algorithm presented by Mackay and others (Mackay *et al.*, 1980; Zagorski and Mackay, 1982), in which the rate of water uptake F_{wc} is given by:

$$\tilde{F}_{wc} = C_1 \left(U_w + 1\right)^2 \left(1 - \frac{F_{wc}}{C_2}\right) \tag{6.23}$$

with U_w the wind speed, F_{wc} the water content and C_1 and C_2 model parameters. C_1 is given as $2 \cdot 10^{-6}$ for emulsifying oils and 0 for others, whilst C_2 is a constant controlling the maximum water content and is suggested to be 0.25 for home heating oil and 0.7 for crude and heavy fuel oil (Reed, 1989). In several other publications, however, the maximum water content for these heavy oils is said to reach values of 75–80% (for example, Huang (1983)). The switch of C_2 between 0.25 and 0.75 is made at a viscosity of 500 cSt, whilst the value of C_1 (0 or $2 \cdot 10^{-6}$) is selected by the user and thus dependent on the emulsion formation tendency of the oil in question.

The main effect of emulsification (increase in the water content) in the model is the change in viscosity and is given as:

$$\frac{\mu}{\mu_0} = e^{\left(\frac{2.5 F_{wc}}{1.0 - C_3 F_{wc}}\right)} \tag{6.24}$$

As with the change of viscosity as a function of the evaporated fraction, it is assumed that the density does not change significantly, compared with the changes in viscosity and is assumed constant. Thus the implementation in the PART(Oil) model uses the kinematic viscosity in the aforementioned equation instead of the dynamic viscosity. The constant C_3 is suggested to be 0.65 (Reed, 1989).

Emulsification does not only affect viscosity (and therefore the dispersion (entrainment) process) but also evaporation. According to Fingas (1994), the effect of emulsification is that the viscosity rises two to three orders-of-magnitude, the spreading rate decreases by a similar value and evaporation nearly ceases.

In order to achieve a link between the emulsification and evaporation in PART(Oil), the water content of the emulsion is used to reduce the evaporation rate. In the implementation in PART, it is assumed that the evaporation ceases when the water content has reached its maximum. This maximum water content is oil type dependent. The evaporation rate is adapted when emulsification occurs by reducing the volatile fraction. This is implemented as follows:

$$F_{ew} = \frac{C_2 - F_{wc}}{C_2} F_{vol} \tag{6.25}$$

Where F_{vol} is the volatile fraction of the spilled oil and Few the adapted volatile fraction, replacing the volatile fraction F_{vol} in equation (6.19). Thus, when the water content reaches its maximum C_2, the adapted volatile fraction reduces to zero and the evaporation halts.

The onset of emulsification can be delayed until evaporation causes the oil characteristics to reach the criteria for emulsification. This delay has been implemented in PART(Oil) by introducing a fraction evaporated oil at which emulsification is initiated (E_v).

Oil density

The density of the oil is affected by evaporation and emulsification. Density is also a function of temperature. In PART, the ADIOS formulation is used, without the dependency of the evaporated fraction

and temperature. Hence, in PART, the density can only change when the oil emulsifies. The density is then a linear interpolation of the densities of water and oil, according to their relative content:

$$\rho_{em} = F_w \rho_w + (1 - F_w)\rho_{oil} \tag{6.26}$$

where

ρ_{em}	Density emulsion [kg/m^3]
F_w	Water fraction
ρ_w	Water density [kg/m^3]
ρ_{oil}	Oil density [kg/m^3]

Sticking of oil

Oil may stick to land and cause damage to ecological sites. In order to simulate the process of oil sticking to land or to the bed of the water column, a sticking probability must be specified. A particle may come into contact with land due to wind effects or horizontal dispersion and it may come into contact with the bed due to vertical dispersion or settling. The particle sticks to the land or bed if a randomly chosen number between 0 and 1 is smaller than the sticking probability given.

Settling of oil particles

Dispersed oil may settle. However, this velocity is generally negative since oil particles are lighter than water. Most oil and refined products are less dense than water, which means they will float when initially spilled. Experience has shown that oil slicks that initially float will remain buoyant even after weathering. The two circumstances under which oil has been noted to sink occur when the oil is mixed with mineral sediment in the water column or when it is burned in-situ, creating a residue that may be of high density.

Weathering of oil

In addition to the processes mentioned earlier, other weathering processes may affect the presence of oil. Processes such as oxidation, bacteriological decay can in PART be simulated by means of a first order decay, for which a decay parameter can be specified.

Appendix 3.4 –

Oil Spill Modelling Output Videos

see separate link at

https://www.portland-port.co.uk/consultations

or contact env@portland-port.co.uk

Appendix 3-4

Oil Modelling Video Outputs Explanatory Note and Contents List

For videos see separate link at https://www.portland-port.co.uk/consultations or contact env@portland-port.co.uk.

Explanation of folder structure:

- Files are organised as follows:
- Level 1 = Location
- Level 2 – wind scenario
- Level 3 – High Water release for oil type followed by Low water release for each oil type

File names are coded with following information in order of appearance in file name:

- H or L = High water or Low water
- Oil type
- Wind direction
- Wind speed
- Repeat of whether output is for high or low water

File name list for video outputs

The Folder and File tree is as follows:

- G6
  - ESE4
    - H-G6-C.HeavyFuelOil-1.ESE4HW+2H.mp4
    - H-G6-F.HeavyCrude-1.ESE4HW+2H.mp4
    - L-G6-C.HeavyFuelOil-2.ESE4LW+2H.mp4
    - L-G6-F.HeavyCrude-2.ESE4LW+2H.mp4

- NE4
    - H-G6-C.HeavyFuelOil-3.NE4HW+2H.mp4
    - H-G6-F.HeavyCrude-3.NE4HW+2H.mp4
    - L-G6-C.HeavyFuelOil-4.NE4LW+2H.mp4
    - L-G6-F.HeavyCrude-4.NE4LW+2H.mp4

- NoWind
    - H-G6-C.HeavyFuelOil-5.NOWINDHW+2H.mp4
    - H-G6-F.HeavyCrude-5.NOWINDHW+2H.mp4
    - L-G6-C.HeavyFuelOil-6.NOWINDLW+2H.mp4
    - L-G6-F.HeavyCrude-6.NOWINDLW+2H.mp4

- SW4
    - H-G6-C.HeavyFuelOil-7.SW4HW+2H.mp4
    - H-G6-F.HeavyCrude-7.SW4HW+2H.mp4
    - L-G6-C.HeavyFuelOil-8.SW4LW+2H.mp4
    - L-G6-F.HeavyCrude-8.SW4LW+2H.mp4

- W4
    - H-G6-C.HeavyFuelOil-9.W4HW+2H.mp4
    - H-G6-F.HeavyCrude-9.W4HW+2H.mp4
    - L-G6-C.HeavyFuelOil-10.W4LW+2H.mp4
    - L-G6-F.HeavyCrude-10.W4LW+2H.mp4

- WSW4
    - H-G6-C.HeavyFuelOil-11.WSW4HW+2H.mp4
    - H-G6-F.HeavyCrude-11.WSW4HW+2H.mp4
    - L-G6-C.HeavyFuelOil-12.WSW4LW+2H.mp4
    - L-G6-F.HeavyCrude-12.WSW4LW+2H.mp4

- WSW6
    - H-G6-C.HeavyFuelOil-13.WSW6HW+2H.mp4
    - H-G6-F.HeavyCrude-13.WSW6HW+2H.mp4
    - L-G6-C.HeavyFuelOil-14.WSW6LW+2H.mp4
    - L-G6-F.HeavyCrude-14.WSW6LW+2H.mp4

- M6
    - ESE4
        - H-M6-C.HeavyFuelOil-1.ESE4HW+2H.mp4
        - H-M6-F.HeavyCrude-1.ESE4HW+2H.mp4
        - L-M6-C.HeavyFuelOil-2.ESE4LW+2H.mp4

        - L-M6-F.HeavyCrude-2.ESE4LW+2H.mp4

    - NE4
        - H-M6-C.HeavyFuelOil-3.NE4HW+2H.mp4
        - H-M6-F.HeavyCrude-3.NE4HW+2H.mp4
        - L-M6-C.HeavyFuelOil-4.NE4LW+2H.mp4
        - L-M6-F.HeavyCrude-4.NE4LW+2H.mp4

    - NoWind
        - H-M6-C.HeavyFuelOil-5.NOWINDHW+2H.mp4
        - H-M6-F.HeavyCrude-5.NOWINDHW+2H.mp4
        - L-M6-C.HeavyFuelOil-6.NOWINDLW+2H.mp4
        - L-M6-F.HeavyCrude-6.NOWINDLW+2H.mp4

    - SW4
        - H-M6-C.HeavyFuelOil-7.SW4HW+2H.mp4
        - H-M6-F.HeavyCrude-7.SW4HW+2H.mp4
        - L-M6-C.HeavyFuelOil-8.SW4LW+2H.mp4
        - L-M6-F.HeavyCrude-8.SW4LW+2H.mp4

    - W4
        - H-M6-C.HeavyFuelOil-9.W4HW+2H.mp4
        - H-M6-F.HeavyCrude-9.W4HW+2H.mp4
        - L-M6-C.HeavyFuelOil-10.W4LW+2H.mp4
        - L-M6-F.HeavyCrude-10.W4LW+2H.mp4

    - WSW4
        - H-M6-C.HeavyFuelOil-11.WSW4HW+2H.mp4
        - H-M6-F.HeavyCrude-11.WSW4HW+2H.mp4
        - L-M6-C.HeavyFuelOil-12.WSW4LW+2H.mp4
        - L-M6-F.HeavyCrude-12.WSW4LW+2H.mp4

    - WSW6
        - H-M6-C.HeavyFuelOil-13.WSW6HW+2H.mp4
        - H-M6-F.HeavyCrude-13.WSW6HW+2H.mp4
        - L-M6-C.HeavyFuelOil-14.WSW6LW+2H.mp4
        - L-M6-F.HeavyCrude-14.WSW6LW+2H.mp4

- QPier
    - ESE4
        - H-QPier-C.HeavyFuelOil-1.ESE4HW+2H.mp4
        - H-QPier-F.HeavyCrude-1.ESE4HW+2H.mp4

        - L-QPier-C.HeavyFuelOil-2.ESE4LW+2H.mp4
        - L-QPier-F.HeavyCrude-2.ESE4LW+2H.mp4

    - NE4
        - H-QPier-C.HeavyFuelOil-3.NE4HW+2H.mp4
        - H-QPier-F.HeavyCrude-3.NE4HW+2H.mp4
        - L-QPier-C.HeavyFuelOil-4.NE4LW+2H.mp4
        - L-QPier-F.HeavyCrude-4.NE4LW+2H.mp4

    - NoWind
        - H-QPier-C.HeavyFuelOil-5.NOWINDHW+2H.mp4
        - H-QPier-F.HeavyCrude-5.NOWINDHW+2H.mp4
        - L-QPier-C.HeavyFuelOil-6.NOWINDLW+2H.mp4
        - L-QPier-F.HeavyCrude-6.NOWINDLW+2H.mp4

    - SW4
        - H-QPier-C.HeavyFuelOil-7.SW4HW+2H.mp4
        - H-QPier-F.HeavyCrude-7.SW4HW+2H.mp4
        - L-QPier-C.HeavyFuelOil-8.SW4LW+2H.mp4
        - L-QPier-F.HeavyCrude-8.SW4LW+2H.mp4

    - W4
        - H-QPier-C.HeavyFuelOil-9.W4HW+2H.mp4
        - H-QPier-F.HeavyCrude-9.W4HW+2H.mp4
        - L-QPier-C.HeavyFuelOil-10.W4LW+2H.mp4
        - L-QPier-F.HeavyCrude-10.W4LW+2H.mp4

    - WSW4
        - H-QPier-C.HeavyFuelOil-11.WSW4HW+2H.mp4
        - H-QPier-F.HeavyCrude-11.WSW4HW+2H.mp4
        - L-QPier-C.HeavyFuelOil-12.WSW4LW+2H.mp4
        - L-QPier-F.HeavyCrude-12.WSW4LW+2H.mp4

    - WSW6
        - H-QPier-C.HeavyFuelOil-13.WSW6HW+2H.mp4
        - H-QPier-F.HeavyCrude-13.WSW6HW+2H.mp4
        - L-QPier-C.HeavyFuelOil-14.WSW6LW+2H.mp4
        - L-QPier-F.HeavyCrude-14.WSW6LW+2H.mp4

Appendix 3.5 –

Oil Spill Modelling Report additional explanatory note

Overview of Oil Spill behaviour

Behaviour of different products at G6, M6 and Queens Pier :

There does not appear to be any observable difference in spill behaviour between the different products modelled within the first 2 hours.

See Figures 1-6 below for comparison of the six different oil type behaviours in the same modelling scenario using G6 as an example

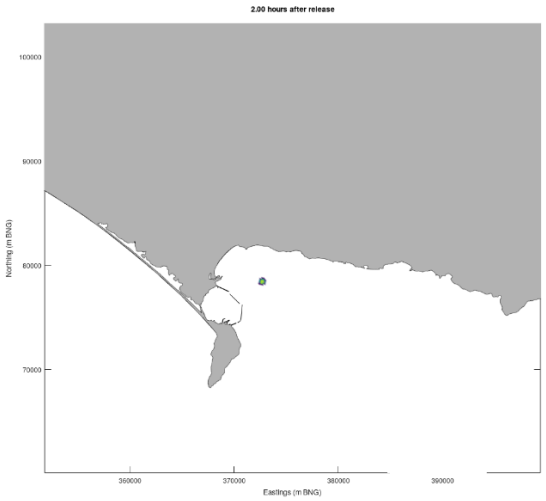


Figure 1: Light Oil; Two hours following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name:H-G6-A.LightOil-7.SW4HW+2H)

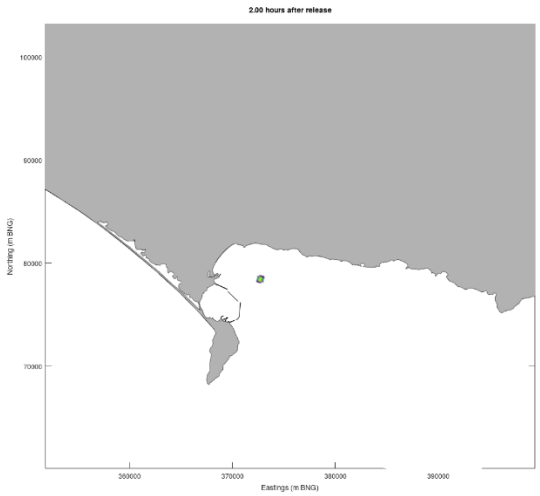


Figure 2: Medium Oil; Two hours following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name:H-G6-B.MediumOil-7.SW4HW+2H)

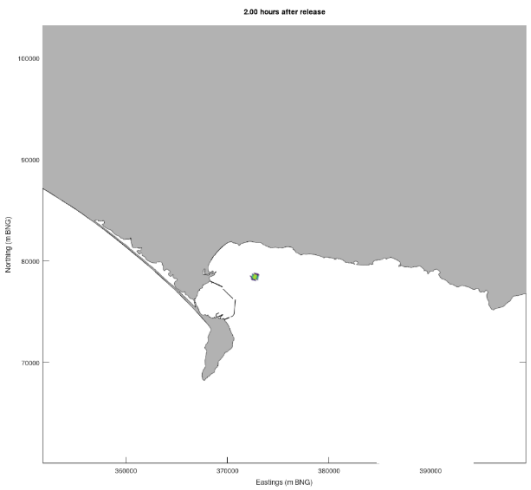


Figure 3: Heavy Fuel Oil; Two hours following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name: H-G6-C.HeavyFuelOil-7.SW4HW+2H)

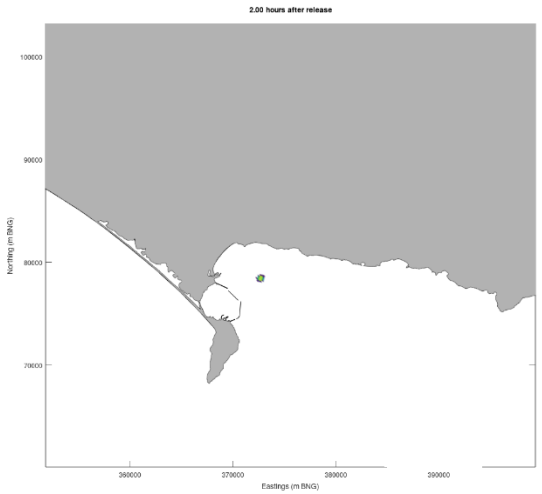


Figure 4: Light Crude Oil; Two hours following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name:H-G6-D.LightCrude-7.SW4HW+2H)

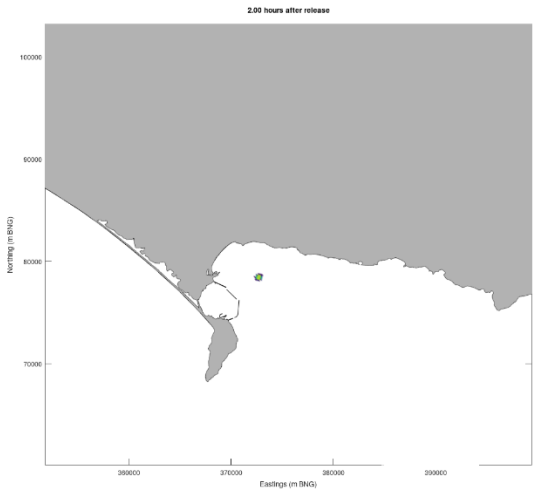


Figure 5: Medium Crude Oil; Two hours following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name:H-G6-E.MediumCrude-7.SW4HW+2H)

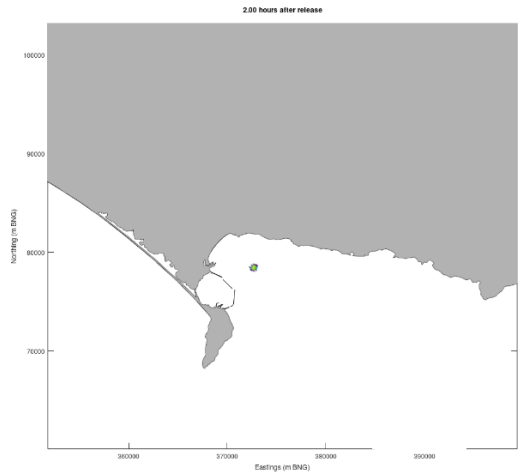


Figure 6: Heavy Crude Oil; Two hours following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name:H-G6-F.HeavyCrude-7.SW4HW+2H)

Figures 7 and 8 demonstrate that the behaviours remain comparable in alternate wind conditions.

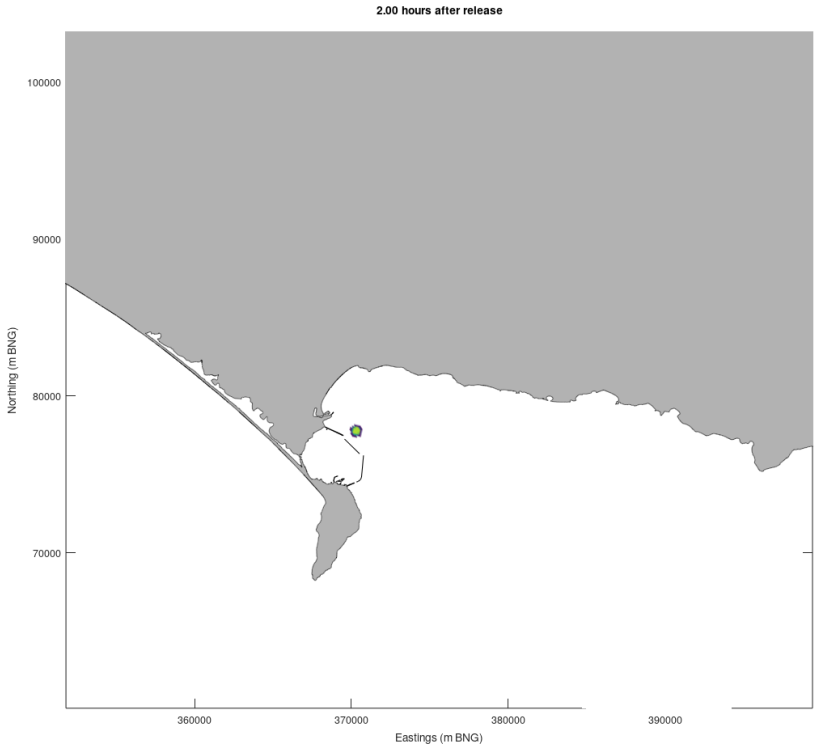


Figure 7: Heavy Fuel Oil; Two hours following release from G6 anchorage at Highwater in a force 4 East South East Wind
(File name: H-G6-C.HeavyFuelOil-1.ESE4HW+2H)

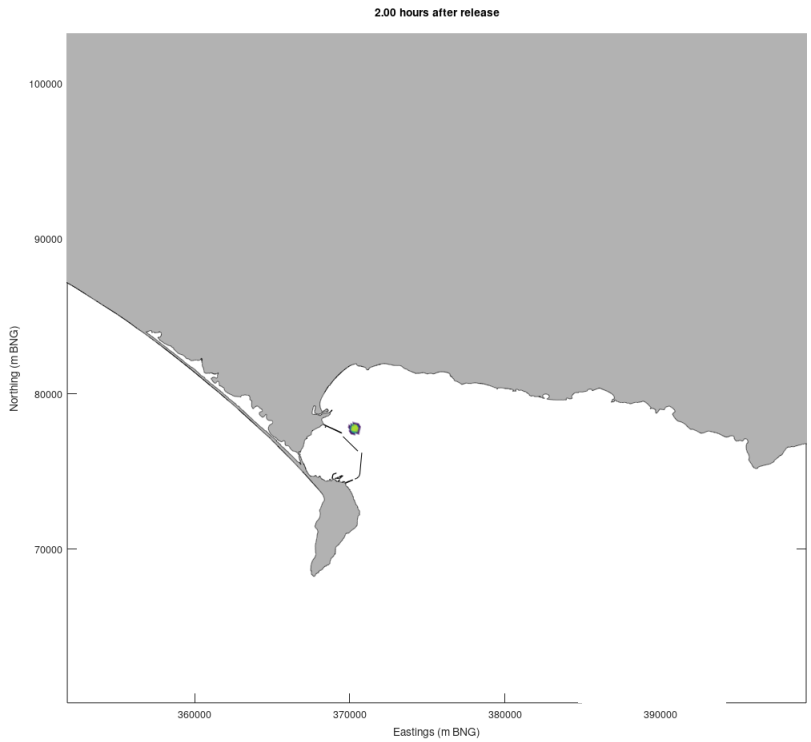


Figure 8: Heavy Crude Oil; Two hours following release from G6 anchorage at Highwater in a force 4 Est South East Wind
(File name:H-G6-F.HeavyCrude-1.ESE4HW+2H)

Behaviour of oil at G6 Anchorage :

There is a marked difference between HW and LW tidal state behaviour if oil is released at G6.

For HW spills, movement appears driven by wind conditions, tidal movement appears to contribute little to overall dispersion pattern as observed by the No Wind simulations.

See Figures 9, 10 and 11 for comparison between modelling scenarios of Heavy Fuel Oil with Wind from South West, No Wind and North East at Highwater

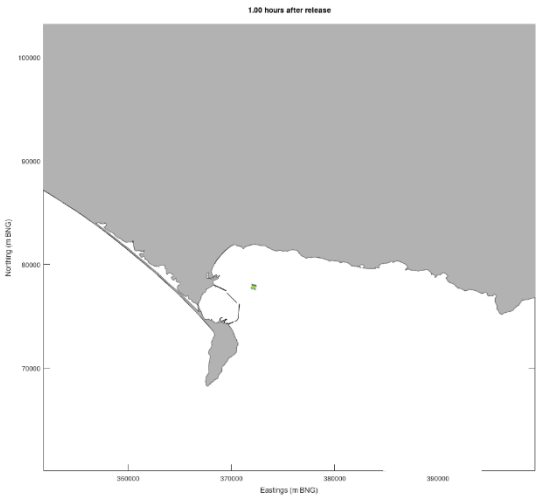


Figure 9 Heavy Fuel Oil; One hour following release from G6 anchorage at Highwater in a force 4 South Westerly Wind
(File name: H-G6-C.HeavyFuelOil-7.SW4HW+2H)

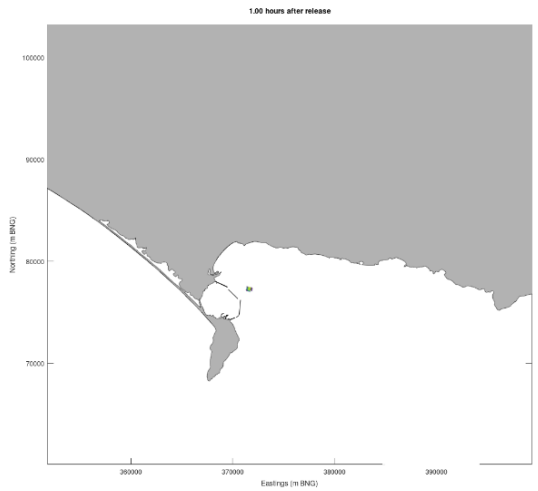


Figure 10: Heavy Fuel Oil; One hour following release from G6 anchorage at Highwater in No Wind
(File name: H-G6-C.HeavyFuelOil-5.NOWINDHW+2H)

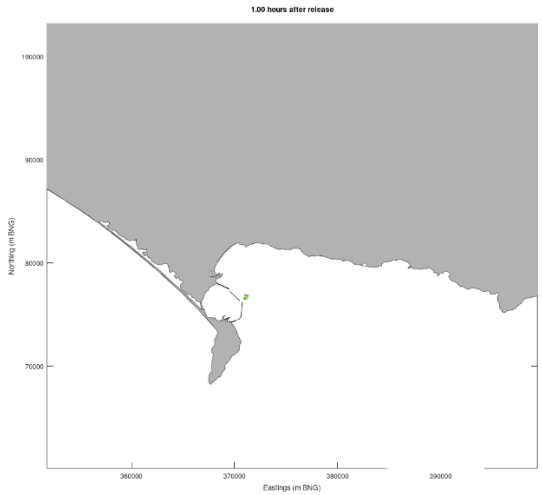


Figure 11: Heavy Fuel Oil; One hour following release from G6 anchorage at Highwater in a force 4 North Easterly Wind
(File name: H-G6-C.HeavyFuelOil-3.NE4HW+2H)

For LW spills, Tidal movement appears to be the major factor behind dispersion. Spills travel rapidly South-South West down towards Portland and round the Bill. Wind only contributes a modifying force to the overall speed and direction of the spills travel.

See Figures 12,13 and 14 for comparison between modelling scenarios of Heavy Fuel Oil with Wind from North East, No Wind and South West at Low Water

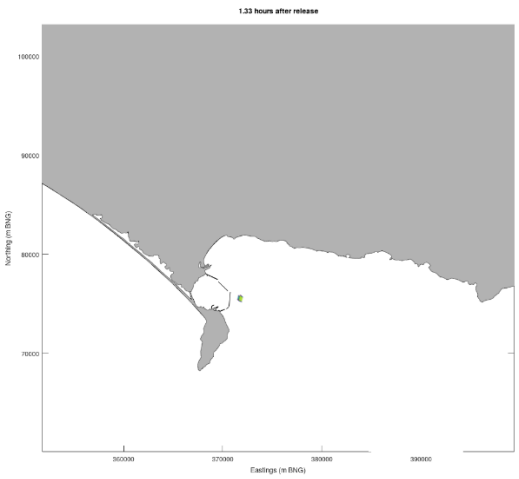


Figure 12: Heavy Fuel Oil; One hour and twenty minutes following release from G6 anchorage at Low water in a force 4 South Westerly Wind
(File name: L-G6-C.HeavyFuelOil-8.SW4LW+2H)

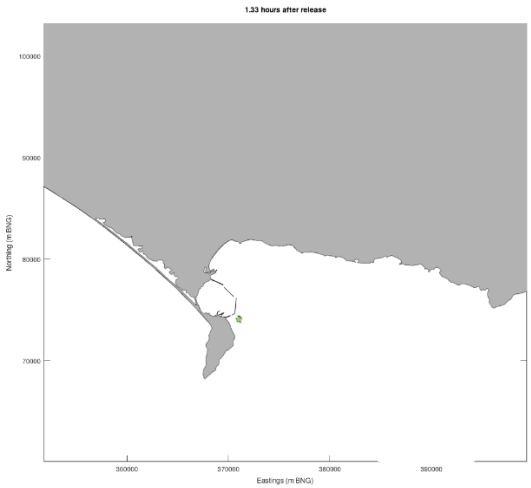


Figure 13: Heavy Fuel Oil; One hour and twenty minutes following release from G6 anchorage at Low water in No Wind
(File name: L-G6-C.HeavyFuelOil-6.NOWINDLW+2H)

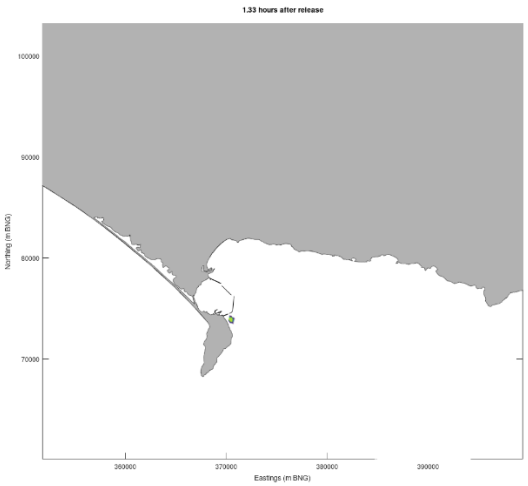


Figure 14: Heavy Fuel Oil; One hour and twenty minutes following release from G6 anchorage at Low water in a force 4 North Easterly Wind
(File name: L-G6-C.HeavyFuelOil-4.NE4HW+2H)

Behaviour of Oil - M6 and Q Pier:

Tidal State does not noticeably affect the behaviour of the spill for releases inside Portland Harbour within the first 2 hours.

See Figures 15 and 16 below comparing releases of heavy fuel oil from M6 anchorage in high and low tide conditions with wind from the West

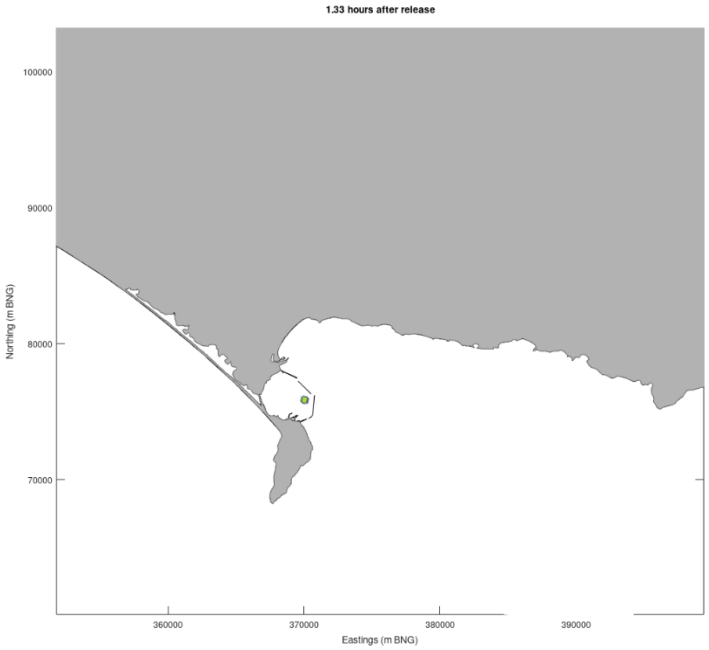


Figure 15: Heavy Fuel Oil; One hour twenty minutes following release from M6 anchorage at Highwater in a force 4 Westerly Wind
(File name: H-M6-C.HeavyFuelOil-9.W4HW+2H)

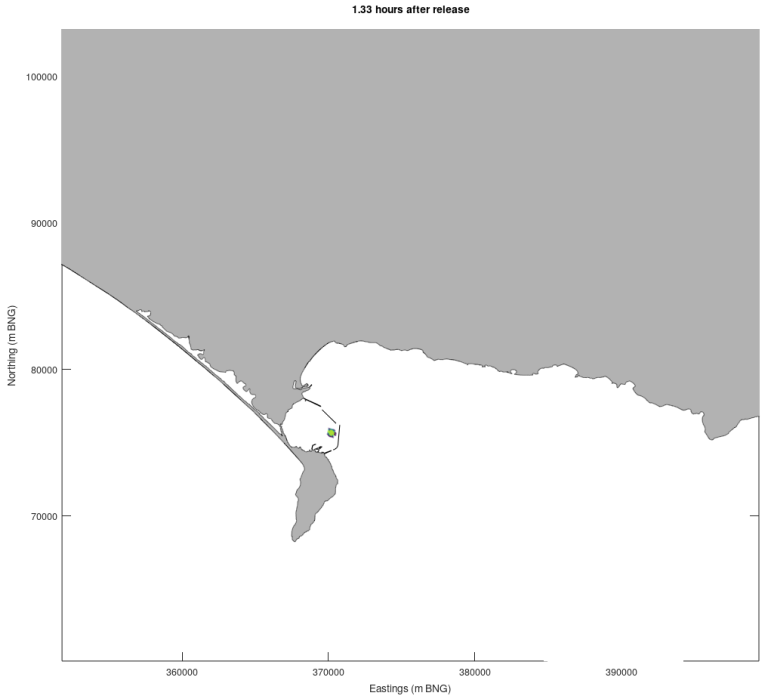


Figure 16: Heavy Fuel Oil; One hour twenty minutes following release from M6 anchorage at Low Water in a force 4 Westerly Wind
(File name: H-M6-C.HeavyFuelOil-10.W4LW+2H)

The movement appears primarily wind driven. See Figures 17 and 18 comparing releases of heavy fuel oil from M6 anchorage at Highwater in South Westerly and North Easterly conditions

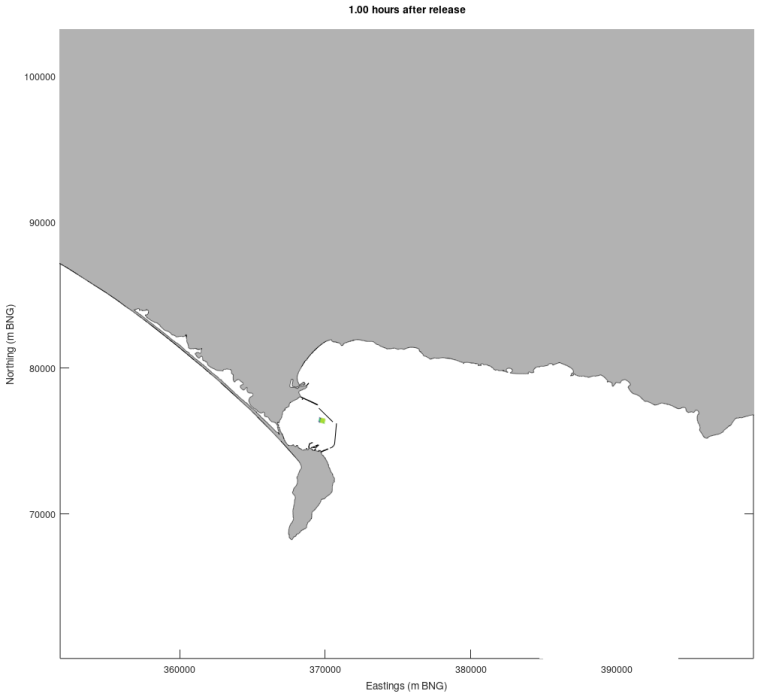


Figure 17: Heavy Fuel Oil; One hour following release from M6 anchorage at Highwater in a force 4 South Westerly Wind
(File name: H-M6-C.HeavyFuelOil-7.SW4HW+2H)

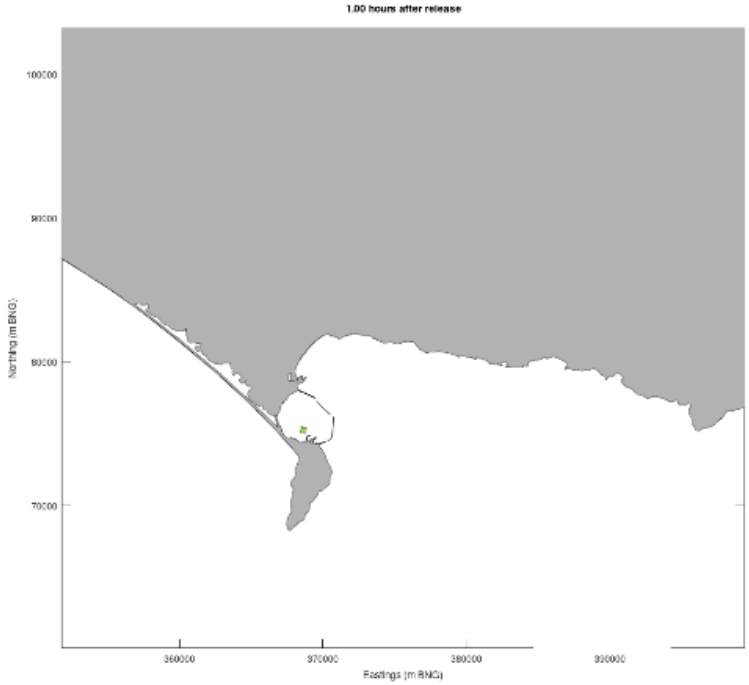


Figure 18: Heavy Fuel Oil; One hour following release from M6 anchorage at Highwater in a force 4 North Easterly Wind
(File name: H-M6-C.HeavyFuelOil-3.NE4HW+2H)

In no wind conditions there is a slight tidal effect with LW releases having slightly greater dispersion towards South Ship Channel compared to the HW models. See Figures 19 and 20 below.

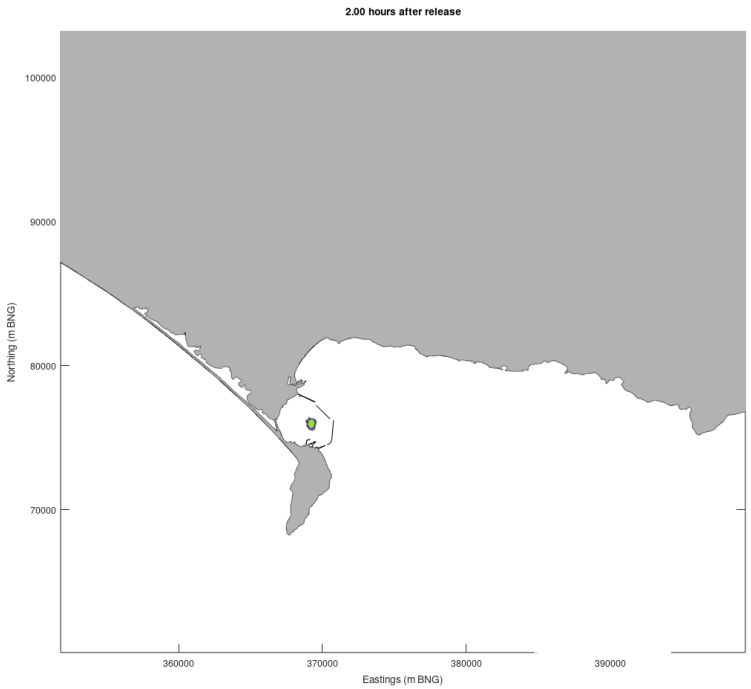


Figure 19: Heavy Fuel Oil; Two hours following release from M6 anchorage at Highwater in No Wind
(File name: H-M6-C.HeavyFuelOil-5.NoWindHW+2H

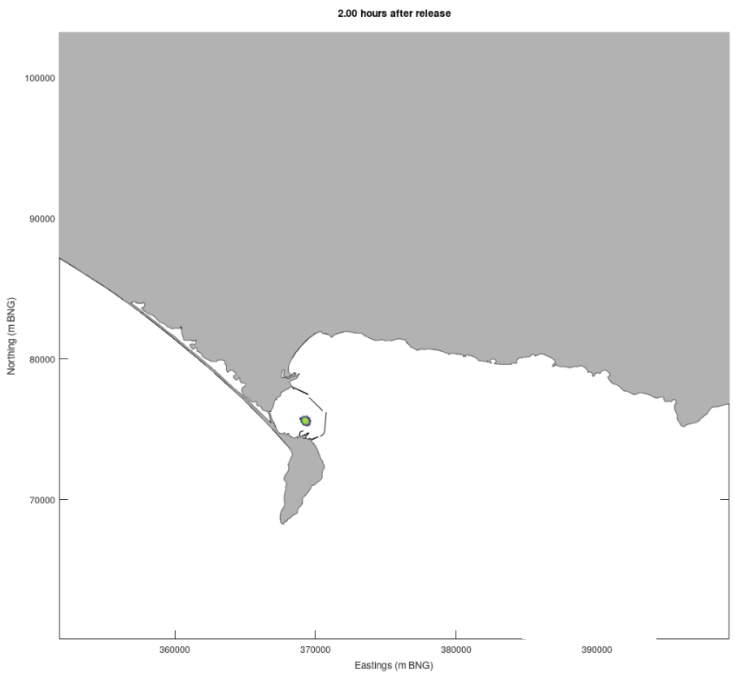


Figure 20: Heavy Fuel Oil; Two hours following release from M6 anchorage at Low Water in No Wind
(File name: L-M6-C.HeavyFuelOil-6.NoWindLW+2H

Appendix 4.1 –

Port Marine Safety Code – SMS Overview (Marine Ref CC52)

Portland Harbour Authority

Port Marine Safety Code Safety Management System Overview

Marine Department Controlled Document
Issue Number 02

Prepared by
Portland Harbour Authority Ltd

Contents

Figures in Chapter

Tables in Chapter

1. Introduction

The Harbour Authority will ensure that the Harbour is operated efficiently and safely so as to safeguard the harbour, its users, the public and the environment. It is committed to performing all of its duties and responsibilities in a safe and efficient manner.

The Harbour Authority will comply with all legal requirements of the Port marine Safety Code and will heed the guidance in the Guide to Good Practice on Port Marine Operations. The functions of the Harbour Authority will be conducted openly and transparently and will be in the overall long-term interests of the harbour stakeholders and beneficiaries.

The Harbour Authority is committed to fully complying with the standards laid down in the Port Marine Safety Code (PMSC) and the management of Navigation shall be in accordance with those standards. The Board, as the Duty Holder, are collectively and individually accountable for the management of marine safety under the code.

In fulfilling its duties, the Harbour Authority is committed:-

- To ensuring so far as reasonably practical the safety of all those that use and work in the harbour.
- To preserving the environment and maintaining approved pollution prevention and nature conservation measures.
- To facilitating the safety of navigation in the harbour and its approaches together with safeguarding the navigational access to and from the harbour.
- To the provision and maintenance of viable harbour facilities.
- To providing an efficient pilotage service.
- To regulating the activities of all those that use the harbour and ensuring the applicable laws are enforced whenever appropriate.
- To review formally the Harbour Authority's plans, policies and procedures at intervals not exceeding 3 years.

Harbour Management Overview

General

Harbour authorities are responsible for ensuring that their ports operate in a manner that avoids marine pollution. Portland Harbour Authority attracts an increasing number of vessels to port and continues to deliver services to meet market needs. This section presents an overview of how Portland Port manages the harbour with safety and environment in mind.

Regulation

Bye-laws, General Directions, Local Notices to Mariners

The Portland Harbour Revision Order 1997 includes details of harbour byelaws. The harbour authority also has the powers to make General Directions (GDs) and release Local Notices to Mariners (LNTMs) all of which include details of harbour management and navigational safety measures.

Admiralty Chart for Portland Harbour (BA 2268)

The Admiralty Chart for Portland Harbour (BA 2268) covers all areas within PHAL and updates are provided to the UKHO with regard to changes

Harbour/Facility information

Table 1a. Harbour/Facility information

Item	Detail
Maximum available draught	Inner Harbour 11.5m, Outer Harbour 16m
Maximum length of vessel	340m
Navigational access	24hr unrestricted access, subject to LOA
Nature of holding ground	Good
Tidal influences	Minimal in Inner Harbour
Mooring availability	None
Repair facilities/dry docks	Available
Tug and pilotage availability	12 hour notice, 6 hours notice and confirmation at 2 hours notice
Sheltered areas/anchorages	Yes
Foreshore description	Sand on west shore/ Rock and sand on north shore
Other commercial interests	Diving operations, underwater surveys

2. Management of Navigation

Safety and environmental protection is of paramount importance to Portland Harbour Authority whose key aim is to ensure a safe and speedy passage of all commercial and naval shipping from sea to port and back to sea again.

The Port Marine Safety Code requires Portland Harbour Authority to publicise a policy statement for Navigational Safety which incorporates not just the basic principles for Navigational Safety but also includes policies on: Pilotage; Marine Conservancy; Environment; and Enforcement and Prosecution for the areas of jurisdiction. To this end, it is Board policy that Portland Harbour Authority shall:

- Maintain an effective navigational Safety Management System (SMS) based on a formalised risk assessment process. Risks will be judged against objective criteria to ensure they are kept "as low as reasonably practicable" (ALARP). The SMS will be kept under a continuous review;
- Review regularly the effectiveness of, and if necessary seek amendments to, its legal powers, in respect of navigational safety;
- As required by the Pilotage Act 1987, provide the required level of pilotage service; and
- Consult with port users and other relevant stakeholders on navigational safety issues and proposed changes to procedures, guidelines, Byelaws and Directions;
- Within port limits monitor and manage vessel traffic through the provision of a 24 hour Local Port Services (LPS), monitor, on a continuous basis:
    - Designated VHF channels;
    - Automatic Identification System (AIS);
    - Meteorological; and CCTV.
    - Regularly review the performance of the LPS system and seek improvements through technical enhancement, development and training of staff together with effective management;
    - Maintain standards for training and certification of marine personnel in line with IALA recommendation V-103 for LPS;
    - Record all relevant, VHF and telephone communications to aid incident investigation and enforcement;

- Through appropriate systems maintain comprehensive and detailed records of all commercial vessel movements within the port;
- Promulgate effectively navigational, tidal, hydrographic and other relevant information to all port users, where appropriate such information will be provided on a commercial basis;
- Prepare, publish and regularly exercise emergency response plans to ensure effective management of any marine related incident within its area of jurisdiction;
- Conduct appropriate hydrographic surveys to ensure safe and efficient navigation within the areas of jurisdiction;
- Ensure that accurate hydrographic data is promulgated and made available to the UK Hydrographic Office;
- Ensure that personnel conducting hydrographic surveys are appropriately trained and qualified;
- Undertake maintenance dredging as appropriate to ensure safe and efficient navigation within the areas of jurisdiction;
- Provide the necessary aids to navigation within port limits, to include navigation buoys, beacons and lighthouses. Such aids to be maintained and operated in accordance with the requirements of the Trinity House Lighthouse Board; and
- Conduct regular audits of all marine navigational operations to ensure the continued effectiveness of such operations.

Harbour Operation - General

Vessel Traffic Management System

Portland Harbour Radio observes the movement of all vessels over 20 metres LOA within the Harbour Limits. The port operate a 24/7 vessel information service only on VHF channel 74.

Portland Harbour Radio

Portland Harbour Radio provides Local Port Services (LPS) on a 24/7 basis. The LPS centre has a good view over most of the harbour with Closed Circuit Television (CCTV) coverage. Radar coverage is provided as part of an integrated Radar/ CCTV/ Automatic Identification System (AIS) suite which has recording and playback functionality, this is in excess of the LPS requirement. Wind information is provided by two anemometers situated on Fort Head and the Distant Range building which again record and graph strength and direction.

Speed Restrictions

A speed limit applies to all areas of Portland Harbour Authority's jurisdiction, except for the Outer Harbour south of a line drawn 048 degrees true from "D" Head as follows:

- a speed limit of 12 knots applies to most of the Outer Harbour north of the line drawn 048 degrees true from "D" Head, except for Newton's Cove.
- a 12 knot speed limit applies to much of the central area of the Inner Harbour, except for vessels under 10 metres which may exceed this limit in the defined area.
- the western and southern periphery of the Inner Harbour, the Controlled Area and within 150 metres of the breakwaters is subject to a 6 knot speed limit.

Monitoring and Policing

There is continuous monitoring of activities by radio and radar. PHAL has a 6.8 metre RIB, marked with the words "Harbour Master" and fitted with a flashing blue light, which is also available for on the water

patrols supported by other harbour authority vessels. Marine Officers periodically patrol (particularly at weekends) and where appropriate, issue verbal guidance and information leaflets published by PHAL which indicate the zones for particular activities, speed limits and useful local telephone numbers.

Vessels in Transit

The statutory duty for reporting and dealing with pollution from any vessel on route to Portland Port, prior to entering Port Limits or pilotage area, lies with the Master and vessel owners. After commencing pilotage into the Port through the designated area of jurisdiction covered by this 'Plan', reporting and response to any pollution incident will be co-ordinated through the Port Control. Vessels will hold their own Emergency Plans.

Place of Refuge

The MCA and Secretary of State's Representative Maritime Salvage & Intervention (SOSREP) have a responsibility discharging the Safety of Life at Sea (SOLAS) obligation for the provision of shelter or safe haven for maritime casualties. Locations within the Portland Port may be called upon to act in such a capacity. Whilst such a requirement does not arise from obligations under OPRC, MCA suggest that contingency arrangements are prepared in consultation with the Regional CPSO.

Of relevance when selecting a port of refuge:

- Portland Port is situated 22 miles north of the westbound shipping lanes, offering fast, safe access 24 hours a day.
- There are no restrictions by locks, tides or air draft. Maximum beam is 50m and Maximum draft 11.5m. Transit through the breakwaters into and out from the inner harbour is restricted to daylight hours for vessels in excess of 200m LOA
- The port has well sheltered waters protected to the West by Chesil Beach and to the East by three man-made breakwaters with depths up to 20m in the outer harbour and up to 15m in the inner harbour.
- Limiting charted depth at the breakwater entrance is 13.8 metres, decreasing to 12.5m within a cable of the entrance.
- With a limited tidal range of 2.0m (Springs) and 0.6m (Neaps) the tidal stream at the breakwater entrances is with a maximum rate of 1 kn (Springs) and of limited extent and duration.
- The port has berths for ships up to 340m LOA with Charted Depths to 11.6m and deeper anchorages in the inner or outer harbour if required. Holding is good with predominantly mud/fine sand bottom.
- We are equipped with three primary towage units offering Bollard Pulls of 55T / 50T / 22T and for certain vessels fire fighting capability as well as work, line boats and passenger transfer boats.
- The Port has the capacity to handle all types of cargo from unit load / containers, general cargo and bulk through to project cargos, heavy lifts and most categories of hazardous goods and is licensed to handle explosives up to 5,600kgs / 1.1 net explosive quantities at alongside berths and 500,000kgs / 1.1 net explosive quantities at anchor.
- There is cargo handling hard standing adjacent to berth, as well as mobile craneage and associated handling plant.

Figure 1a Portland Harbour Authority Jurisdiction, Land Ownership & Joint Pilotage Area

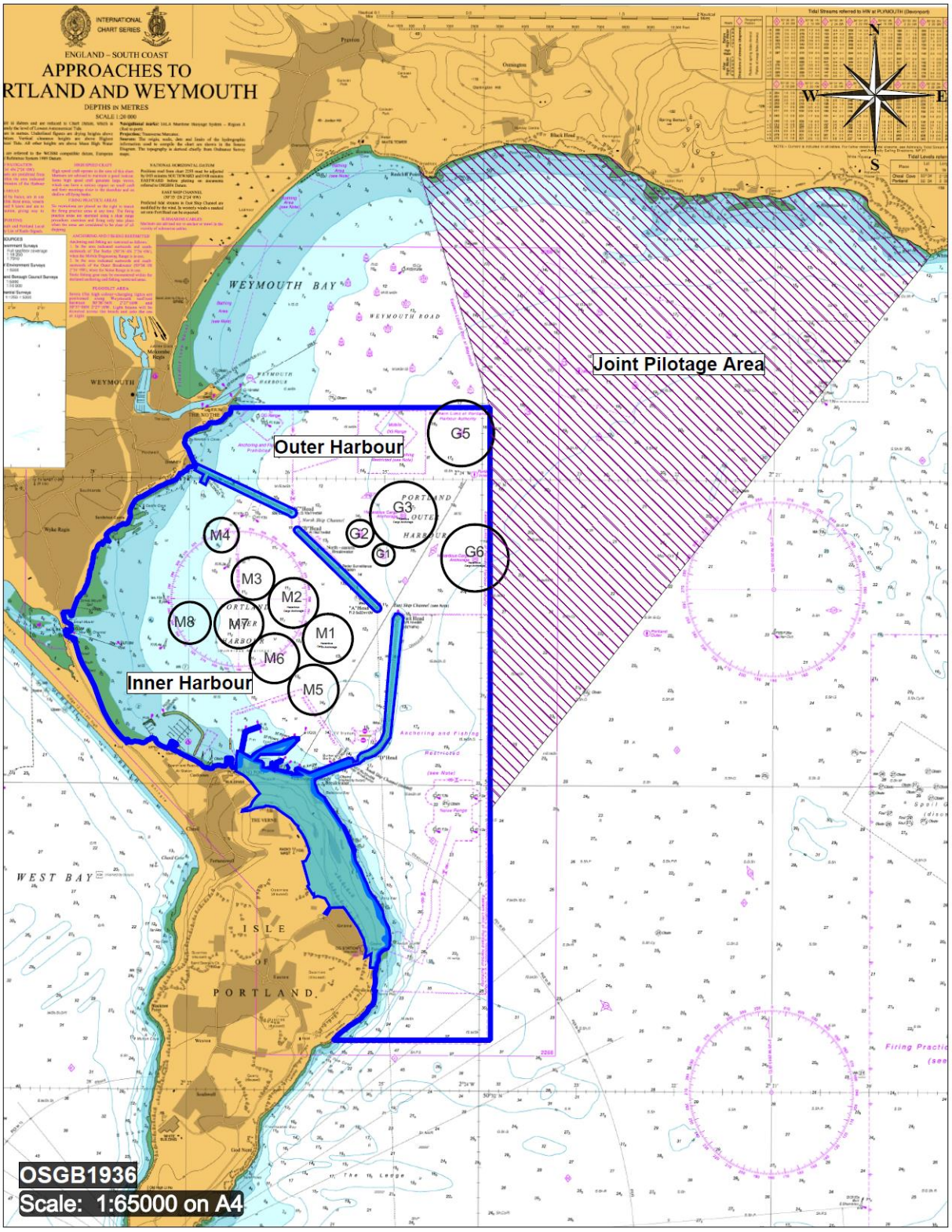
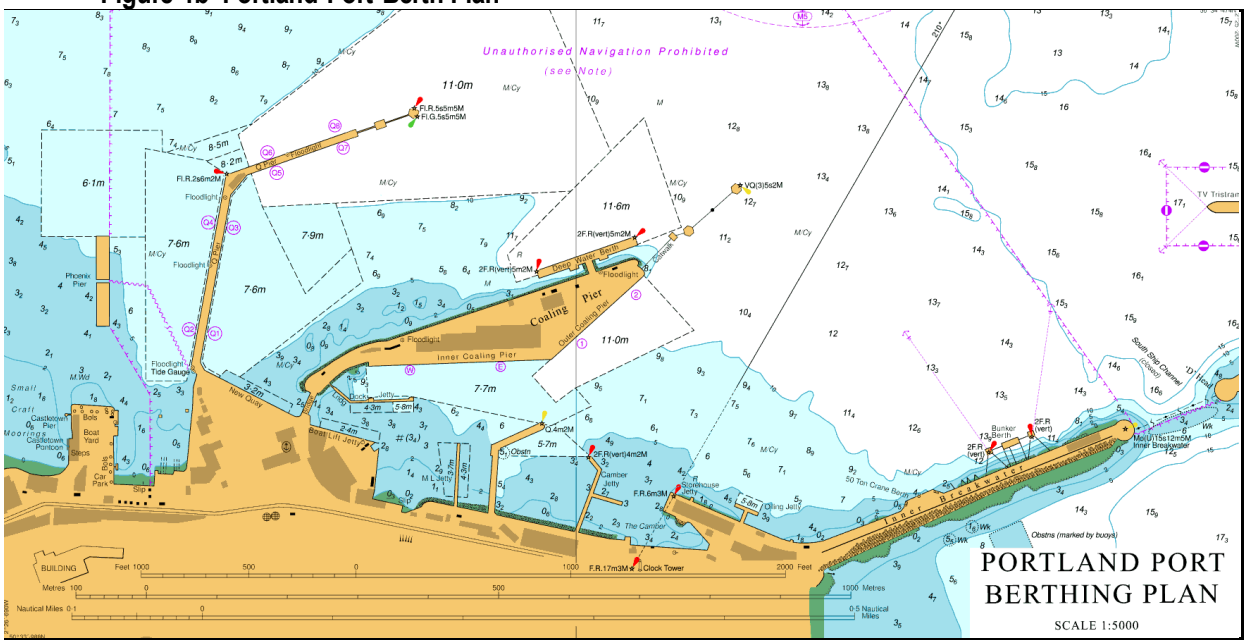


Figure 1b Portland Port Berth Plan



3. Pilotage

The Pilotage Service

PHAL is the Competent Harbour Authority for Portland Harbour. Pilotage is compulsory for any vessel of over 50 metres LOA, any vessel over 20 metres LOA carrying dangerous cargoes, and any vessel of over 20 metres LOA carrying more than 12 passengers. Certain vessels owned by the Ministry of Defence (MOD); vessels under the command of a Pilotage Exemption Certificate (PEC) holder; and vessels using the Weymouth Bay anchorages are exempt from pilotage.

PHAL employs a number of authorised Pilots.

Pilotage Exemption Certificates

The syllabus for a PEC candidate and for an authorised Portland Pilot is generally the same. However, the tripping requirement for a PEC candidate is a minimum of 12 passages with an authorised Portland Pilot in the 6 months immediately prior to the application - no less than four of these trips in darkness. The PEC issued relates specifically to the candidate and the examined ship. PEC holders requiring examination for another vessel undertake an abbreviated course, primarily to ensure that they have adequate experience of handling the subject vessel.

The Pilot/Master Information Exchange

This is conducted and formalised by the 'Pilot/Master Information Exchange Form' and 'Passage Plan' this form is completed by the pilot and the ship's master before each act of pilotage starts. This is generally much easier to achieve on departure than on arrival. However, if either the master of a vessel inward bound to the port or the pilot, needs more time to discuss the passage plan, or to fill in the forms, additional time can be easily generated by either taking way off the vessel or taking a round turn out to seaward if there is no other traffic to affect in the area.

4. Marine Services

Harbour Operations - Berthing/ Un-berthing/ Entry /Exit Criteria

In good weather and light winds most of the berths within Portland Inner harbour are relatively straight-forward. There is ample room and usually little current. The harbour is exposed to winds from the easterly quadrant. North westerly winds can cause problems around some of the berths. The best shelter in the Outer Harbour is within the 15 metre contour.

The Chesil Bank can act as an aerofoil, accelerating westerly winds by as much as 20% to 25%. Q2 and Q4 berths can be difficult to approach and leave in westerly winds of 15 knots or more. This is partly due to the confined access to the berths, which can restrict tug operations, and partly due to the added effect of the anti-clockwise tidal flow around the Inner Harbour, which sets on to the inner end of Q Pier.

East Ship Channel and North Ship Channel entrances are 210 and 200 metres wide, with a depth of 12.4 metres in the North entrance and 12.3 metres inside the East entrance. The South entrance is closed to commercial traffic and is blocked by the submerged wreck of HMS Hood. A tidal stream enters the Inner Harbour by North Ship Channel and rotates anti clockwise around the harbour past and through the jetties before exiting via the South and North entrances.

The tidal stream in North Ship Channel is straight-forward. In East Ship Channel there is a significant change in the tidal streams affecting vessels entering the Inner Harbour. This sudden change particularly affects deep draft vessels.

Harbour Operation - Commercial Port Services - Pre-Arrival Procedures and Documentation

Vessels arriving at Portland (whether for bunkers, other vessel services or coming alongside) are required to submit an arrival proforma which details amongst others their principal dimensions, draft, last/next port and manoeuvring aids. From this information the vessel is then cross checked against a commercial shipping database and their pending arrival is added to the Denbridge database - a web-based planning tool which allows the Harbour Office staff and Pilots to plan determine towage and manpower requirements. A pre-arrival email is then sent to the ship which details the arrival procedure for the vessel. This details pilot boarding arrangements and some port information such that the Master may arrive being well informed.

Harbour Operation - Commercial Port Services - Towage

Towage

PHAL provides and operates three tugs which are available for any vessel at 12 or 6 hours notice.

1. **"Wyke Castle"** a twin Azimuth Stern Drive (ASD) tug with 50t bollard pull and fire fighting capability;
2. **"Maiden Castle"** a twin ASD tug with bow thruster and 55t bollard pull.
3. **"Rufus Castle"** a twin Azimuth Stern Drive (ASD) tug with 50 bollard pull and fire fighting capability:

The tugs provide towage if required for vessels entering, leaving, berthing, unberthing and anchoring in the Inner Harbour and they provide a waterborne fire-fighting capability in all areas. The tugs are assigned VHF Channel 71 for working with the pilots - this is of particular importance as it keeps the main harbour control frequency (Channel 74) clear and assures free communication to and from the tugs.

Tug Availability and Capabilities

PHAL has formal, published minimum towage requirements which are listed in GD No. 2 of 2002. These are based in part on empirical formulae for vessel windage and in part local knowledge of the idiosyncrasies of the berths. The GD details tug requirement according to vessel length and whether or not the vessel has manoeuvring aids. For larger vessels, requirements are determined on a case-by-case basis according to the expected weather conditions and tug availability. The tugs are considered to be adequate for the range and type of vessels using PHAL at present.

Harbour Operation - Training Activities

A wide range of military and civilian training takes place within the harbour. The main organisations that are involved in training include the Defence Diving School, Royal Naval Air Station Yeovilton, WRTA, Royal Marines, Army Divers, W&PNSA, MCA and local sailing and sports diving clubs. Training is well organised by the relevant organisation(s) and it is understood that safety cover would normally meet or exceed the guidelines provided by the RYA. There is good co-ordination with the Harbour Authority where these activities take place, consisting of a Permit to Work system and communication where appropriate with Harbour Control. This minimises the risk of conflict with other harbour users. There are no records of navigational incidents that have resulted from training-related activities within the harbour.

Harbour Operation - Leisure and Sport

Keelboat and Dinghy Racing

The majority of yachting and dinghy races are organised and run by Castle Cove Sailing Club and WPNSA, however, other clubs which operate within the harbour include the RDYC, the RNSA, and the WPCA. Since the first NRA, there has been a significant expansion at WPNSA with their organising sailing events (racing and training) most weekends of the year as well as International sailing series. As a result, close co-operation is maintained between event organisers such that races (and commercial activities) take place at times and locations which minimise potential conflicts with other users.

Segregation and control for water space users

As a result of this diversity of harbour users there has been increased need for segregation and control for water space users, particularly:

- PWCs are small, fast, and highly manoeuvrable craft that can pose a significant risk if operated irresponsibly. This has been controlled by issuing a GD (No 1 of 2012) which restricts their use to the Portland Outer Harbour other then when launching and using part of the Marina Access Route to access the Portland Outer Harbour.
- Windsurfing and kite surfing generally take place near to the western shore and well away from commercial activities. Kite surfing is a relatively new and growing sport within the UK that can pose significant risks to all harbour users (they are extremely fast and can be very difficult to control) it is currently regulated by GD No. 1 of 2017 and GD No. 1 of 2018.
- Recreational diving and spear-fishing is regulated by permit and the establishment of 'no dive' zones which are policed by the Local Port Service (LPS) and Harbour Rigid Inflatable Boat (RIB) patrol. Commercial dive charters operate under licensed skippers.

5. Performance Monitoring

This safety plan augments any existing safety policy required by the Health and Safety at Work etc Act 1974 and relates to Marine Operations and the requirements of the Port Marine safety Code.

Portland Harbour Authority Limited as the Statutory Harbour Authority for Portland Harbour is committed to:

- Manage the relevant assets of the authority safely and efficiently.
- Discharge the duties and powers of the harbour authority in relation to marine operations.
- Maintain relevant harbour equipment to appropriate industry standards.
- Recruit and train operational staff to nationally agreed competence levels.
- Ensure that staff are properly trained for enforcement, emergencies and contingencies.
- In making these commitments the harbour authority has appointed Captain M Shipley the Harbourmaster & Marine Manger and his deputies as the marine operations safety officers who will be responsible for the following:
- Ensuring all risks are assessed and reduced to As Low As Reasonably Practical
- Reporting, investigating and reporting all accidents and to ensure that lessons learnt are widely disseminated to appropriate persons and bodies.
- Carrying out routine safety inspections on marine operations equipment and reassessing risks as appropriate.
- To form and chair the marine operations safety committee and liaise regularly with all those involved with marine operations and to act accordingly on feedback.
- To review this safety policy and recommend revisions to the Board at least every 3 years.

Additionally:-

Portland Harbour Authority Limited is committed to discharging all of its statutory duties and to remaining open, accountable and fit for purpose. Its plan to manage the safety of marine operations is to comply with all of the requirements of the Port Marine Safety Code and to follow the guidance in the Guide to Good Practice on Port Marine Operations.

In doing so it will, despite commercial pressures,

- Take reasonable care so that all who may choose to navigate in the Harbour may do so without danger to their lives or property
- Conserve and promote the safe use of the Harbour.
- Have regard to efficiency, economy and safety of marine operations.
- Take such action that is necessary or desirable for the maintenance, operation, improvement or conservancy of the Harbour.

The Harbour Authority has a responsibility to protect the general public from dangers arising from marine activities within their port and to take every reasonable precaution to prevent acts or omissions that may cause personal injury to any persons within Portland Harbour.

The Harbour Authority will base its powers and policies on a formal assessment of hazards and risks and it will maintain a formal safety management system which will ensure that all risks are managed so that they are as low as reasonably practicable.

The Harbour Authority has appointed an independent Designated Person who will bi-annually audit the Harbour Authority's compliance with the Port Marine Safety Code and who will report directly to the

Board. The Designated Person shall assess in his reports the Harbour Authority's performance against its plan of complying with all of the requirements of the Port Marine Safety Code and the accompanying Guide to Good Practice on Port Marine Operations.

Port Marine Safety Code

The PMSC is a government initiative aimed at formalising the duties and responsibilities for safety and environmental protection within UK ports. It is aimed at directors, commissioners or trustees who are members of the boards of harbour authorities with statutory powers and responsibilities to regulate the navigation of vessels within their waters. There are no exemptions from the Code: its principles are considered to be applicable to harbours of all sizes, irrespective of their resources or level of traffic.

The port retains a Designated Person offering independent audit. The Designated Person conducts an audit on a 6 monthly basis and attends the board annually reporting directly on findings.

Navigational Risk Assessment and Safety Management System

The PMSC requires that all harbour authorities base their powers, policies, plans and procedures on an FNRA and that they maintain a Safety Management System (SMS) to control the risks that are identified. The navigational risk assessments are continually reviewed and if required amended quarterly or after a related incident or near miss. The Safety Management System is a tool used in the day to day management of the harbour and a database is maintained of all the safety measures in place and their status.

The PMSC tasks those who manage port marine safety to do so in accordance with industry best practice. The port is independently audited on a 6 monthly basis.

Standard Operational Procedures

As part of the Safety Management System the Harbour Authority has in place Standard Operating Procedures within the Marine Departments Operations Manual. 'Emergency Action Cards' have also been prepared for use in the event of an Emergency and are retained in a separate folder. A copy of the Standard Operating Procedure for Oil Pollution (SOPE2) and associated Emergency Action Card is found at **Appendix 1E**.

Portland Harbour Consultative Committee (HCC)

The Portland Harbour Consultative Committee (HCC), which is a statutory requirement and attended by representatives of user groups and provides an effective mechanism to identify conflicts between harbour users and to ensure that they are discussed and resolved amicably. The HCC ensures that issues and activities are kept under review and effectively managed as they increase in popularity within Portland Harbour. The HCC meets 3-4 times per year.

Hamm Beach User Group

The Hamm Beach User Group, a stakeholder group representing various leisure users of Hamm Beach on the western shore of Portland Harbour meets quarterly. The group provides an effective mechanism to identify conflicts between users of Hamm Beach and to ensure that they are discussed and resolved amicably.

General Public Dissemination

Some visitors who are unfamiliar with the harbour occasionally operate in the wrong areas and fail to observe speed limits and other regulations. As a result of the initial Navigational Risk Assessment in 2001,

it was suggested that information regarding the designated areas for particular activities should be given wide publicity. Large fixed signs, which provide information on bye-laws and other restrictions, have been erected at the slipway in Castletown, on the shore opposite the Chesil Beach Centre car park, at the Ferrybridge launching area and at the Harbour entrances.

6. Conservancy

Portland Harbour Authority has a duty to conserve the harbour so that it is fit for use as a port. The harbour authority also has a duty of reasonable care to see that the harbour is in a fit condition for a vessel to be able to use it safely.

Portland Harbour Authority Limited covers a water area of approximately 6 square miles all of which is regularly surveyed as part of a rolling programme.

Portland Harbour Authority provides users of the harbour with information about conditions in the harbour such as depths of water, General Directions, Local Notices to Mariners, etc.

Portland Harbour Authority has a duty and powers as a local lighthouse authority; and specific powers in relation to wrecks.

The duties described above cover specific requirements as detailed below:

- To survey as regularly as necessary and find the best navigable channels;
  - Controlled area, 1 Year
  - Other Areas, 3 Years, as determined by PHAL

- To place and maintain navigation marks where they will be of the best use to navigation;
- To keep a 'vigilant watch' for any changes in the sea bed affecting the channel or channels and move or renew navigation marks as appropriate;
- To keep proper hydrographic records and hydrological information;
- To ensure that hydrographic information is published in a timely manner; and
- To provide regular returns and other information about the authorities' local aids to navigation as the General Lighthouse Authority may require.

7. Emergency Preparedness and Response

The Portland Port Emergency Plan

The Portland Port Emergency Plan sets out the measures to be taken when dealing with incidents/emergencies arising within the port area. The Emergency Plan is specifically written to satisfy the requirements of "The Dangerous Goods in Harbour Areas Regulations, 2016". The Emergency Plan provides a framework for dealing with other emergencies which may occur within Portland Port and covers the responsibilities and procedures for incidents on vessels alongside berths in the port, on board vessels underway, at anchor or aground within the jurisdiction of PHAL and incidents ashore in the land area of the port.

The Portland Oil Spill and Marine Pollution Contingency Plan

Harbour authorities are responsible for ensuring that their ports operate in a manner that avoids marine pollution, and for responding to incidents within their limits. Outside their limits, the owners and masters of ships and the operators of offshore installations bear the primary responsibility for ensuring that they

do not pollute the sea and for incident response. The MCA may need to use national assets to protect the overriding public interest in the response to a marine pollution incident when they face problems that exceed the reasonable response capabilities e.g. counter pollution equipment or expertise.

The current stock of pollution response equipment at Portland Port is in excess of that required for Tier 1, to cover small operational spillages. Adler and Allen Ltd are contracted to provide a response to medium sized spillages, i.e. Tier 2 cover. In the event of a Tier 3 large scale spillage, the MCA may decide to implement the National Contingency Plan and take charge of the incident and the counter pollution measures. The 'Plan' is exercised twice yearly, and is reviewed and updated on a regular basis. Credible Tier 1, 2 and 3 scenarios are summarised below.

8. Port Security

Portland Harbour Authority Limited as the Statutory Harbour Authority for Portland harbour has statutory powers to enforce relevant legislation and in some circumstance's prosecution will be appropriate. Prosecution is a serious step and must be regarded as the ultimate sanction. A prosecution will only be initiated when the alleged conduct has been such that the Harbour Authority cannot impose an appropriate sanction itself and the matter therefore deserves the attention of the court.

The Harbour Authority is committed to assisting other enforcement agencies, including the Police in the pursuance of their statutory duties. The Harbour Authority will liaise with any enforcement agency that may have an interest in any matter being considered for prosecution.

Each case will be considered on its individual merits and a prosecution will only be initiated in accordance with the Harbour Authority's enforcement policy. Having duly considered the Harbour Authority's internal policies due regard will be given to the Code for Crown Prosecutors. Any decision to initiate a prosecution will be recorded in writing and the reasons for initiating the prosecution will be given.

Any investigation carried out by the Harbour Authority will be conducted pursuant to the Police and Criminal Evidence Act 1984 with due regard to the applicable Code of Practice.

The Harbour Authority recognises that once a prosecution has been commenced control of the matter is ceded to the Courts and the Criminal Justice System.

Any vessel in a category listed below, intending to enter Portland Port or bound for a facility within the Port will be required to demonstrate its compliance with the ISPS Code. It must supply the details required by the Transport Security Directorate (TRANSEC) of the United Kingdom Department for Transport.

- Passenger vessels, including high speed passenger vessels
- Cargo vessels, including high speed vessels, of 500 gross tonnage upwards.

9. Environmental

Portland Port is a privately-owned statutory harbour authority, commercial port operator and freehold estate owner. The operation extends across 2400 hectares of water space, 200 hectares of land estate (including maritime business park and 'greenspace') and 5km's of breakwaters.

Portland Port commits to the implementation of a 'Sustainability and Environmental Management System' to manage and improve its environmental, economic and social sustainability performance which:

- *can be integrated with the organisations marine, landside and commercial management systems and business processes;*
- sets *measurable targets and objectives;*
- delivers *continuous improvement in overall performance;*
- *is subject to audit and review.*

In implementing such a system Portland Port further commits to:

- delivering upon statutory, regulatory and competent authority environmental duties and responsibilities
- the application of sustainability and environmental principles to strategic and specific development and operational planning to include:
    - securing the necessary consents for development and operations and compliance with legislation
    - preventing, minimising and reducing operational impacts through a process of risk assessment, method statements, procedures, permits to work, plans, guidance and information appropriately communicated depending on the purpose and requirement
    - pursuing efficiencies in the use of natural resources such as energy and carbon, water and waste so that reductions can be achieved
    - provision of appropriate and relevant training to staff, contractors and users depending on the requirement
    - incident reporting and prompt response to incidents or emergencies
- pro-active and constructive communication and engagement with statutory and non-statutory organisations including regulators, government, industry bodies and local community as examples
- explore and deliver 'GreenPort' initiatives and opportunities across the organisation.

Appendices Chapter 5. Fauna and Flora

Appendix 5.1 – Habitats Regulation Assessment

Appendix 5.2 – Nature Conservation Review

Appendix 5.1 – Habitats Regulation Assessment

Habitat Regulation Assessment for the proposed Transfer of Liquid Cargoes between vessels

(Projects (a), (b) and (c))

version 21st June 2021

(Incorporating Natural England feedback in letter dated 10th July 2020,and updates taking account of environmental assessment process that forms part of Oil Transfer Licence application to MCA.)

Introduction

Overview

This technical note documents a Habitat Regulations Assessment (HRA) for 3 projects relating to transfer operations between vessels as follows:

a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases)
b. Liquid Petroleum Gas
c. Liquid Cargoes (substances consisting wholly or mainly of oil)

For the purpose of defining oil, the definition in The Ship to Ship Regulations 2020 is used which defines this to be "oil of any description and includes spirit produced from oil of any description, and also includes coal tar". This definition is the same as that in the Merchant Shipping Act 1995.

Our conclusion having undertaken a "Habitat Regulation Assessment" is that the project will not have a significant effect on any European Sites and in reaching this conclusion are now consulting Natural England to seek confirmation they are in agreement. This document sets out the assessment and in doing so refers to relevant supporting documentation/ measures.

In considering our assessment for each of the 3 projects and responding in writing it would be helpful if Natural England could respond individually to each project i.e. providing a separate letter for each. This helps with the administrative aspects of managing transfer operations going forward.

Assessment

The assessment comprises the following parts:

Part A:	Introduction and information about the plan or project and initial assessment of credible risk to sites
Part B:	Information about European Site(s) which could be affected
Part C:	Screening of the plan or project for appropriate assessment

Part D:	Appropriate assessment and conclusions on site integrity
Part E:	Permission decision with respect to the European Site(s)

A series of tables have been created in support of each section and can be found at the end of this report

Figure 1-3 are also included as follows:

- **Figure 1** shows locations where transfer operations are proposed
- **Figure 2** shows Marine Protected Areas (Harbour view)
- **Figure 3** shows Marine Protected Areas (wide view)

The primary information source for this assessment is from the following website: https://designatedsites.naturalengland.org.uk/SiteSearch.aspx.

Documentation

The documentation is packaged in 3 parts (i, ii and iii) as follows:

i. **Habitat Regulation Assessment and Nature Conservation Review**

- Habitat Regulation Assessment and associated tables (this document)
- Nature Conservation Review and associated tables (for other designated sites and species not covered by the HRA)

ii. **Mitigation/ Measures**

- See **Appendix A** for overview. In the case of the Oil Transfer Application these documents are included as appendices to the Environmental Statement. They are the same for all 3 projects.

iii. **General Directions** (made under article 16 of The Portland Harbour Revision Order 1997 https://www.legislation.gov.uk/uksi/1997/2949/article/16/made)*

1) Transfer of Liquid Cargoes excluding Oil and Liquified Gases between Vessels (GD No. 1 of 2020) – **applicable to Project (a)"**
2) Transfer of Liquid Petroleum Gases between Vessels (GD No. 2 of 2020) – **applicable to Project (b)**
3) Transfer of Liquid Cargoes consisting of Oil between Vessels (GD No. 3 of 2020) – **applicable to Project (c)**

Introduction and information about the plan or project and initial assessment of credible risk to sites

The relevant information is enclosed within the following list of tables:

	Part A	
	Table A2	Details of the plan or project
	Table A2i	Activities relevant to Category Transport
	Table A2ii	Pressures relevant to activities associated with Category Transport
	Table A3i	Designated Sites Location Plans
	Table A3ii	Initial Assessment of Risk Part 1
	Table A3iii	Initial Assessment of Risk Part 2

In terms of an explanation, the following points are relevant:

- **Table A2**
  - Includes details about what in this case is considered to be a 'Plan'.
- **Table A2i, A2ii, A2iii and A2iv –**
  - the 'JNCC Pressures-Activities Database' (see http://jncc.defra.gov.uk/default.aspx?page=7136) has been consulted in order to populate these tables
  - the following categories have been identified as being relevant to fisheries:
    - Transport
  - 'Activities' relevant to each of these categories are listed in **Table A2i**
  - 'Pressures' relevant to these activities have also been listed and can be found in **Table A2ii**
  - In the case of both activities and pressures the complete list is provided however where they are not relevant strikethrough has been used to demonstrate this is the case.
- **Table A3i –**
  - the following sites are listed in the supporting tables:
    - Chesil Beach & The Fleet SAC
    - Chesil Beach & The Fleet SPA
    - Chesil Beach & The Fleet Wetland Area of International Importance under the Ramsar Convention (Ramsar site)
    - Studland to Portland Special Area of Conservation (SAC)
    - Isle of Portland to Studland Cliffs SAC
- **Table A3ii and A3iii –**
  - Includes an initial assessment of risk for each of the listed sites
  - It concludes that there is or may be a credible risk that the plan subject to this assessment might undermine the conservation objectives of a European Site for the following sites:
    - Chesil & the Fleet SAC
    - Chesil Beach & The Fleet SPA

- Chesil Beach & The Fleet Wetland Area of International Importance under the Ramsar Convention (Ramsar site)
- Studland to Portland Special Area of Conservation (SAC)
- Isle of Portland to Studland Cliffs SAC

- Further Habitats Regulations assessment is therefore necessary – see Part B which follows.

A. Information about European Site(s) which could be affected

The relevant information is enclosed within the following list of tables:

	Part B	
	Table B	Information about the European Sites that could be affected and associated Conservation Objectives (inclusing supplementary advice)

In terms of an explanation, the following points are relevant:

- **Table B.** includes the following information:
  - Site name
  - Qualifying (Designated) Features Summary
  - Availability of Conservation Objectives and Supplementary Advice
  - Weblink to Natural England Conservation Objectives if available
  - Weblink to supplementary advice for Conservation Objectives if available
  - Marine and/ or Terrestrial
  - Proximity to where STS operations will take place
  - legally underpinned by

The next section discusses the screening of the plan for appropriate assessment.

B. Screening of the plan or project for appropriate assessment

The relevant information is enclosed within the following list of tables:

	Part C	
	Table C1	Test 1
	Table C2i	Risk Assessment (without mitigation) - Part 1 (relevant Features/ Subfeatures and associated attribtues, targets, seasonal considerations and supporting notes)
	Table C2ii	Risk Assessment (without mitigation) - Part 2 (Risk of significant effects alone or in-combination and its mechanism/ pathway and reason)
	Table C2iii	Test 2

- **Table C1 –**
  - The table considers whether the plan is either directly connected with or necessary to the (conservation) management (of the European Site's qualifying features) and concludes this is not the case therefore the next steps are necessary.
- **Table C2i –**
  - Includes the information necessary to inform a risk assessment without mitigation
  - the following features/ sub-features are considered to be relevant:

Habitat –

- Coastal Lagoon,
- Reefs,
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae),
- Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi),
- H1210 Annual vegetation of drift lines,
- H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts,
- H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia);

Species

- Widgeon (Mareca penelope) - Non-breeding,
- Little tern (Sternula albifrons) - Breeding,
- S1654. Gentianella anglica; Early gentian

- **Table C2ii –**
  - Table has been populated following interrogation of Natural England's supplementary advice
  - The following attributes are also considered to be relevant:
    - Non-native species and pathogens
    - Water quality – contaminants
    - Water quality – dissolved oxygen
    - Water quality – turbidity
    - Air Quality
- **Table C2iii –**
  - In conclusion an Appropriate Assessment is considered to be the next step which is considered further in the next section.

C. Appropriate assessment and conclusions on site integrity

In light of the screening decision above in section C, this section contains the appropriate assessment of the implications of the plan or project in view of the Conservation Objectives for the European Site(s) at risk.

The relevant information is enclosed within the following list of tables:

	Part D	
	Table D3	Appropriate Assessment (with mitigation)
	Table D5	Conclusion on Site Integrity

- **Table D3 –**
  - In undertaking the necessary navigational risk assessment, creating standard operating procedures, controls and putting local regulations in place prior to Projects (a), (b) and (c) commencing, 'no adverse effect' on the designated sites can be concluded.
  - These additional measures avoid or reduce the effects on the attributes. See **Appendix A** for an overview of what these are. In the case of the Oil Transfer Application these documents are included as appendices to the Environmental Statement. They are the same for all 3 projects.
  - **GENERAL DIRECTIONS 1-3* and applicability to projects are as follows:**
    - Transfer of Liquid Cargoes excluding Oil and Liquified Gases between Vessels (GD No. 1 of 2020) – **applicable to Project (a)"**
    - Transfer of Liquid Petroleum Gases between Vessels (GD No. 2 of 2020) – **applicable to Project (b)**
    - Transfer of Liquid Cargoes consisting of Oil between Vessels (GD No. 3 of 2020) – **applicable to Project (c)**

**General Directions (made under article 16 of The Portland Harbour Revision Order 1997 https://www.legislation.gov.uk/uksi/1997/2949/article/16/made)*

- Of relevance to ballast water management and air quality paragraphs 13 and 14 of each General Direction apply.
- **Table D5 –**
  - In our opinion, it can be ascertained that Projects (a), (b) and (c) will not have an adverse effect on the integrity of sites discussed in this HRA, either alone or in combination with other plans and projects, with condition(s).

D. Permission decision with respect to the European Site(s)

The relevant information is enclosed within the following table:

	Part E	
	Table E	Permission decision with respect to European Sites

- **Table E –**
  - In conclusion it is our opinion that consent for Projects (a), (b) and (c) can be granted but only subject to the implementation of the following condition:

    "Prior to commencing transfer operations for the following projects (a), (b) and (c)

    a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases)
    b. Liquid Petroleum Gas
    c. Liquid Cargoes (substances consisting wholly or mainly of oil)

    Portland Harbour Authority will adhere to the conclusion of the navigational risk assessment and implement the range of measures set out in the standard operating procedure and put in place the General Directions proposed."

Figure 1 – Proposed Transfer Operation Locations

(using MAGIC and applying 2km buffer to the perimeter of relevant anchorages and berths)

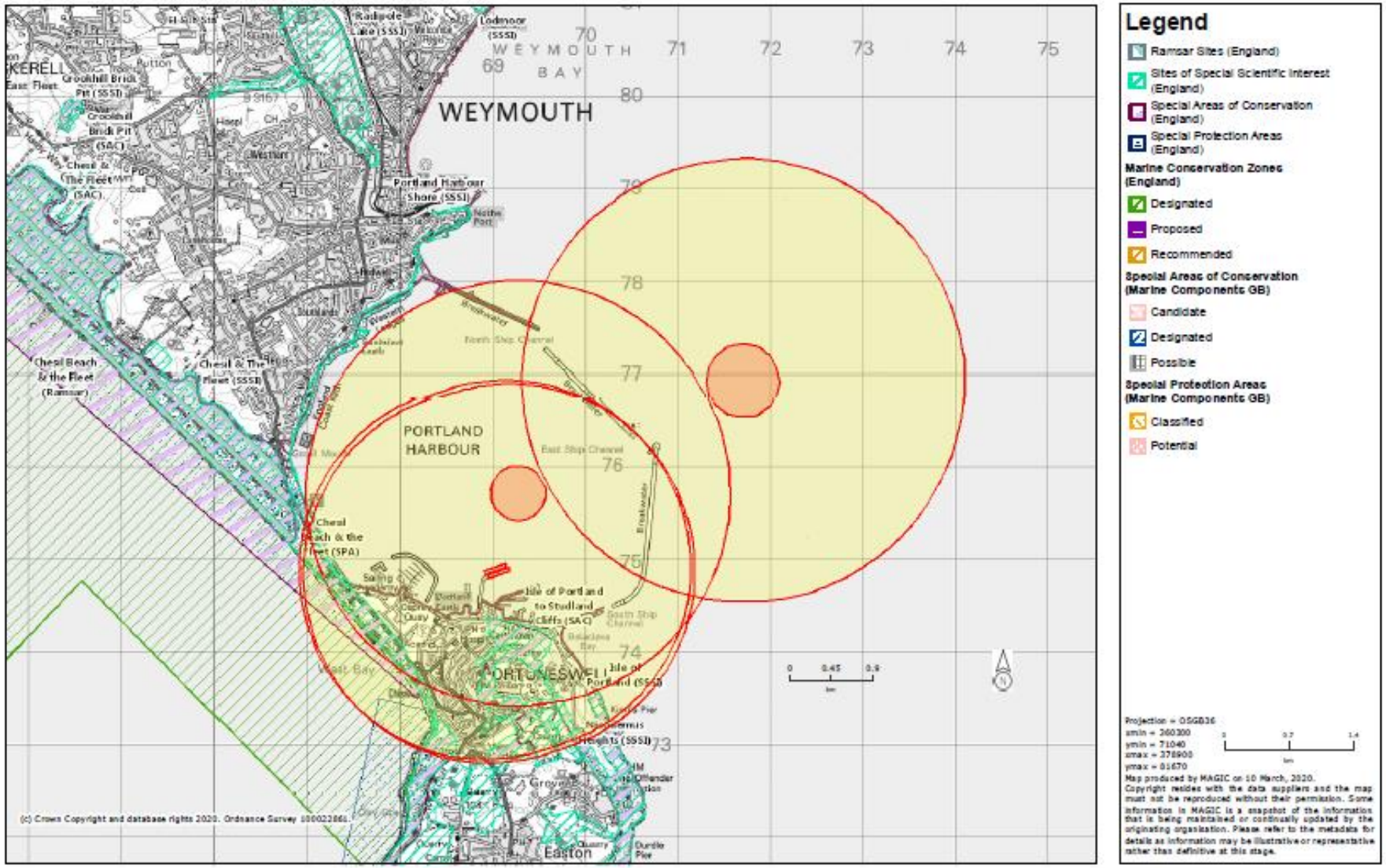
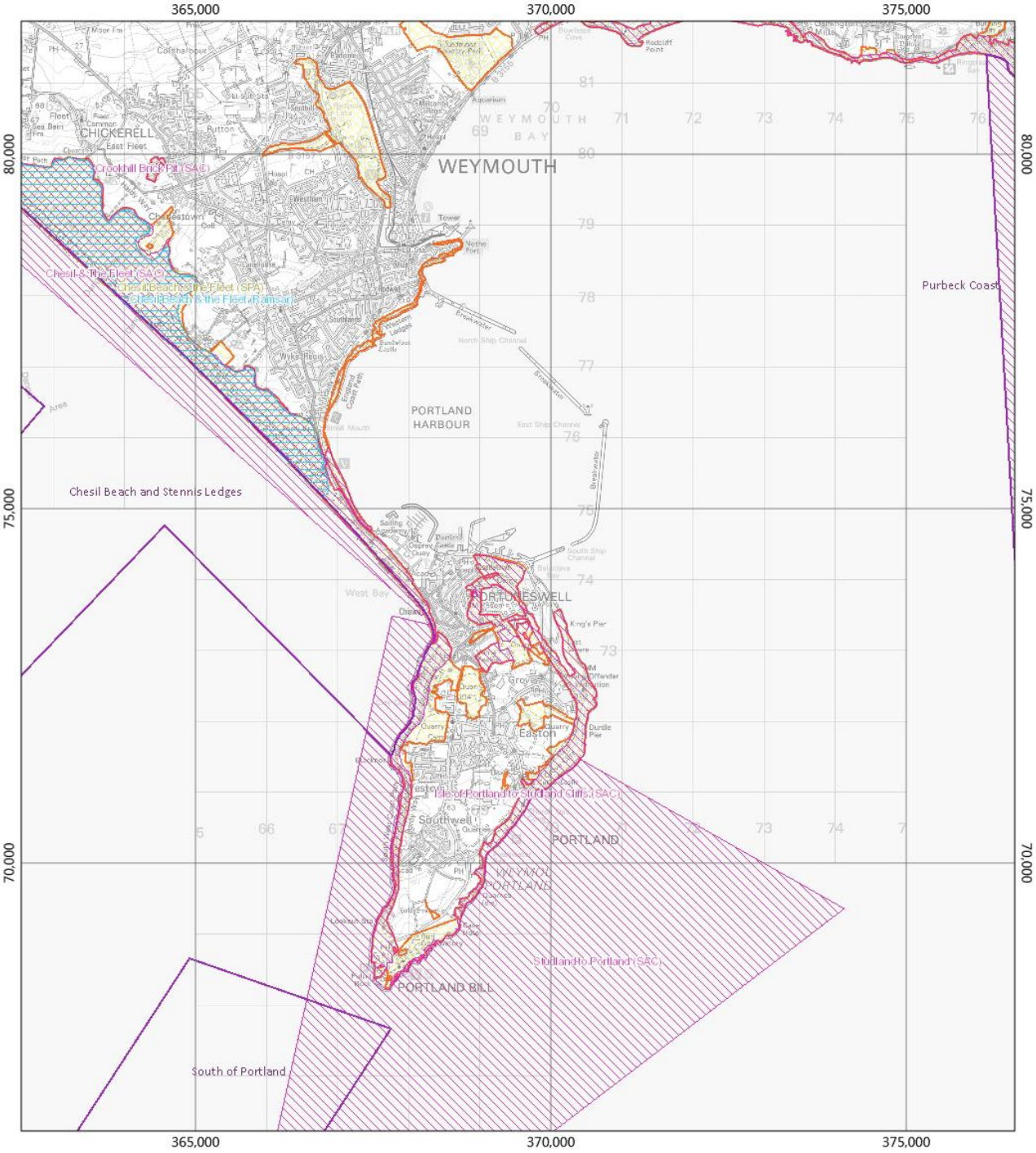


Figure 2 – Marine Protected Areas around Portland (Harbour)



Key

- Marine Conservation Zones © Natural England, JNCC
- Ramsar sites England © Natural England
- Special Areas of Conservation England © Natural England
- Special Protection Areas England © Natural England
- Special Protection Areas England - Potential © Natural England
- SSSI England Simplified © Natural England
- Ordnance Survey (Greyscale) © Ordnance Survey

NATURAL ENGLAND

Map Produced from WebMap on 14/05/20
Map Projection: British National Grid
Map Scale at A3: 1:52,913

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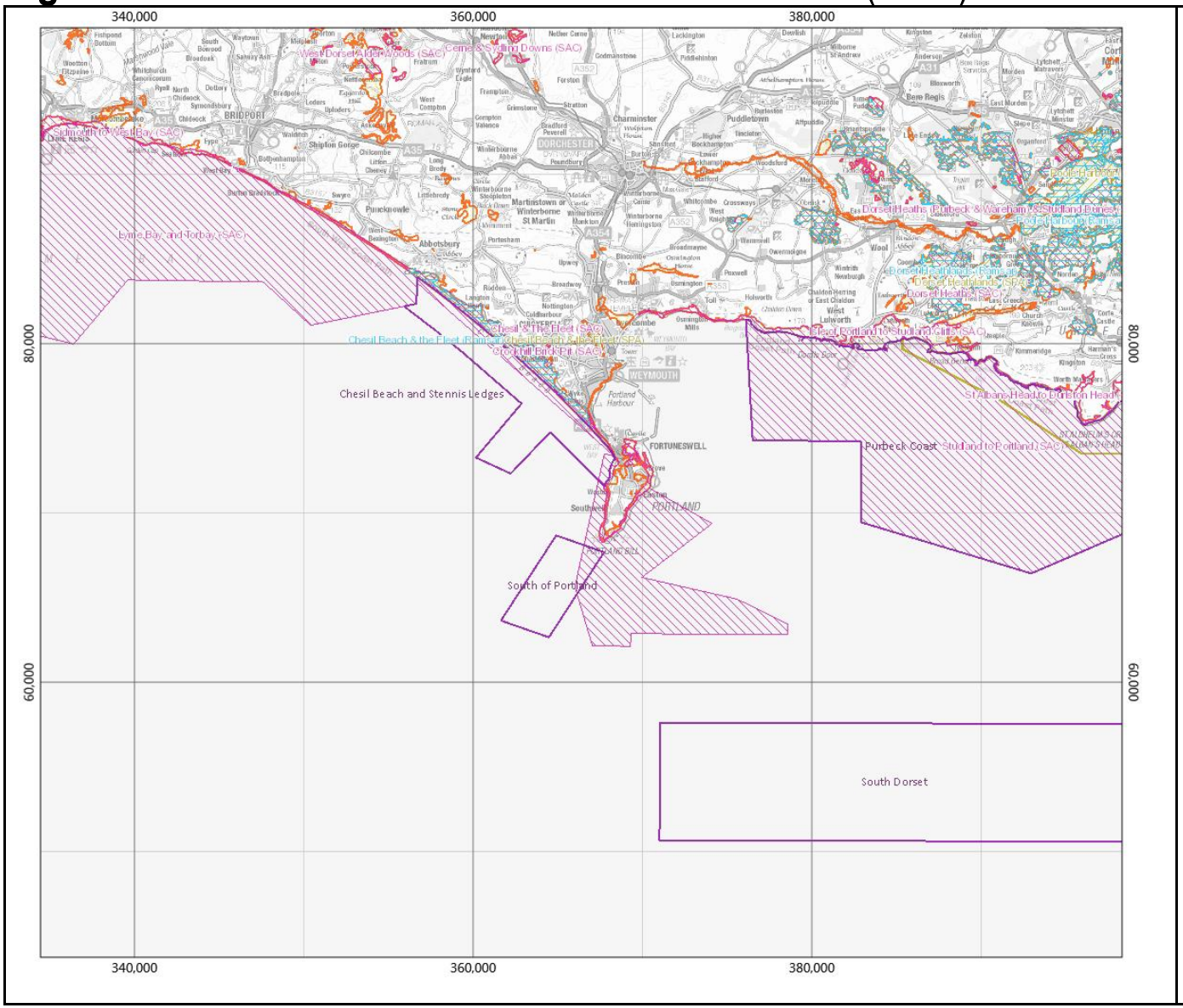
Figure 3 – Marine Protected Areas around Portland (Wide)



Key

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- Special Protection Areas England © Natural England
- Special Protection Areas England - Potential © Natural England
- SSSI England Simplified © Natural England

NATURAL ENGLAND

Map Produced from WebMap on 14/05/20
Map Projection: British National Grid
Map Scale at A3: 1:211,653

Complete List of Tables

Appendix A

Mitigation/ Measures

1) Overview

Portland Harbour Authority compliance with the Port Marine Safety Code and it's Safety Management System has been discussed in Chapter 4. This chapter considers the measures that would be adopted in connection an oil transfer operation at Portland. These are considered under the following sub-headings:

- Risk Assessments
- Notices in Force
- Controlled Commercial Documents
- Operations Manual - Standard Operating Procedures
- Marine Pollution Plan
- Emergency Plan

2) Risk Assessments

This section relates to risk assessments. The Port Marine Safety Code requires that all harbour authorities base their powers, policies, plans and procedures on formal navigational risk assessment and that they maintain a Safety Management System (SMS) to control the risks that are identified.

The applicable Portland Harbour Authority Risk Assessments for STS operations is as follows:

Appendix No.	Marine Ref	Document Title
A11-2-1		Navigational Risk Assessment & Management of Service Providers

In summary, the Port has developed a navigational risk assessment specific to Ship to Ship Transfer Operations. This underpins the controls that have been identified for operations to take place such that risk can be considered "As Low As Reasonable Practical".

3) Notices in Force

This section includes a description of Portland Harbour Authority Notices in Force. These are typically Local Notice to Mariners, General Directions and Harbour Masters Directions and uploaded to https://www.portland-port.co.uk/local-notice-to-mariners-general-directions-and-harbour-masters-directions.

The applicable Portland Harbour Authority Notices in Force for STS operations are as follows:

Appendix No.	Marine Ref	Document Title
A11-3-1	GD2020 No.3	General Direction 2020 No 3 Transfer of Liquid Cargoes Consisting of Oil Between Vessels.
A11-3-2	GD2021 No X	COMPULSORY TOWAGE – SHIP TO SHIP TRANSFER OPERTIONS (STS) DRAFT
A11-3-3	No 18/2017	Ballast Water Management
A11-3-4	GD2016 No.1	General Direction No 1 of 2016 Portland Bunkering Operations. NOTE: In the case of debunkering the measures for bunkering would apply as the operation is the same but in reverse.

In summary a local regulation in the form of a General Direction has been developed for Ship to Ship Transfer of Oil and a second one relating to Towage and Ship to Ship Transfers. The existing Local Notice to Mariners relating to Ballast Water Management will continue to apply.

4) Controlled Commercial Documents

The following includes a description of Portland Harbour Authority controlled commercial documents. These are documents which are controlled and maintained up to date. These are used disseminate information to port users and Harbour Authority staff.

The applicable Portland Harbour Authority controlled commercial document for STS operations are as follows:

Appendix No.	Marine Ref	Document Title
A11-4-1	CC1	Pilotage Directions (V.10)
A11-4-2	CC49	Certificate of Approval to Operate within Portland Harbour as a Service Provider of Transfers Of Liquid Cargoes Between Vessels (Ship To Ship Transfer (STS) Operations)
A11-4-3	CC47	Transfer Operations Between Vessels Form 1 - Initial Transfer Application
A11-4-4	CC50	Form 2 - Declaration of Compliance from Person in Overall Advisory Control (POAC)
A11-4-5	CC51	Form 3 – Declaration of Compliance from Visiting Vessels
A11-4-6	CC46	Pre-Transfer Information Checklist For Use By Harbour Office
A11-4-7	CC48	Pre-STS Transfer Meeting Checklist For Use By Harbour Office
A11-4-8	CC24b	Emergency Contact Details For Vessels Calling For Ship To Ship Transfer
A-11-4-9	CC08	Marine Department Training Requirements

In summary, controlled commercial documents that apply to STS operations include certificate of approval to operate, Application Forms to undertake Transfer, Declarations of Compliance, Pre-Transfer checklists and meeting checklists, emergency contacts and training requirements.

5) Operations Manual - Standard Operating Procedures

The following includes a description of Portland Harbour Authority Operations Manual - Standard Operating Procedures. These are procedures that form part of the Safety Management System to ensure compliance with the Port Marine Safety Code.

The applicable Portland Harbour Authority Operations Manual - Standard Operating Procedures for STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-5-1	SOPHO21	Transfers of Liquid Cargoes Between Vessels
A11-5-2	SOPHO22	Ship to Ship Transfers
A11-5-3	SOPHC24	Harbour Office Local Port Services (LPS) During Ship To Ship Transfer Operations (STS)
A11-5-4	SOPHT23	STS Tug Operations DRAFT
A11-5-5	SOPHC17	Harbour Office Local Port Services
A11-5-6	SOPPG1	Pilotage -General Information
A11-5-7	SOPMC7	Pilot and Passenger Transfer Procedures
A11-5-8	SOPE2	Pollution Preparedness and Response **NOTE – this will replace the version included in Appendix 1E in the Oil Spill & Marine Pollution Contingency Plan 2020-2025**
A11-5-9	SOPE4	Pollution Reporting

In summary, standard operating procedures include ones that are specific to Ship to Ship Transfer Operations such as general measures, provision of local port services, tug operations, pilotage, pilot boats, pilots and transfer procedures and pollution response.

6) Marine Pollution Plan

The following includes a description of Portland Harbour Authority Marine Pollution Plan. This document sets out Portland Harbour Authority's Oil Spill & Marine Pollution Contingency Plan. The 'Plan' details the contingency arrangements for responding to actual or threatened marine pollution incidents within the Portland Harbour area. If an accidental oil spill was to take place then application of the OSCP would considerably reduce the environmental effects of a spill minimising the scale and extent of an oil spill.

The Portland Harbour Authority Marine Pollution Plan applies to all marine pollution risks in the port including STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-6-1	N/A	Portland Harbour Authority Marine Pollution and Oil Spill Contingency Plan. Version 30th June 2020 **NOTE – Appendix 1E of this document to be replaced with updated SOPE2 (see Appendix 11-5-8)**

Portland Harbour Authority has updated its Plan to take account of Ship to Ship Transfer Operations. Since updating the Plan it has also updated its Standard Operating Procedure for Marine Pollution which will replace the version that currently forms a supporting appendix to the Plan.

7) Emergency Plan

The following includes a description of Portland Harbour Authority Emergency Plan. This document outlines the procedures, roles and responsibilities required to respond to an emergency within the port other than for marine pollution.

The applicable Portland Harbour Authority Emergency Plan for STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-7-1	N/A	Portland Harbour Emergency Plan

In summary, this document will be an important document in support of STS operations but in reviewing the operation no specific changes are proposed.

8) Summary and Conclusion

Portland Harbour Authority compliance with the Port Marine Safety Code and it's Safety Management System has been discussed in Chapter 4. This chapter considers the measures that would be adopted in connection an oil ship to ship transfer operation at Portland. These are considered under a series of categories as follows:

- **Risk Assessments** – the Port has developed a navigational risk assessment specific to Ship to Ship Transfer Operations. This underpins the controls that are described in the sections that follow.
- **Notices in Force** - a local regulation in the form of a General Direction has been developed for Ship to Ship Transfer of Oil and a second one relating to Towage and Ship to Ship Transfers. The existing Local Notice to Mariners relating to Ballast Water Management will continue to apply as would the GD No 1 of 2016 would apply to bunkering and debunkering.
- **Controlled Commercial Documents –**Controlled commercial documents that apply to STS operations include certificate of approval to operate, Application Forms to undertake Transfer, Declarations of Compliance, Pre-Transfer checklists and meeting checklists, emergency contacts and training requirements.
- **Operations Manual - Standard Operating Procedures** - The standard operating procedures include ones that are specific to Ship to Ship Transfer Operations such as general measures, provision of local port services, tug operations, pilotage, pilot boats, pilots and transfer procedures and pollution response.
- **Marine Pollution Plan** - Portland Harbour Authority has updated its Plan to take account of Ship to Ship Transfer Operations. NOTE Appendix 1E of Portland Harbour Authority's Oil Spill & Marine Pollution Contingency Plan will be replaced with updated SOPE2 that forms part of the measures proposed for this operation.
- **Emergency Plan -** this document will be an important document in support of STS operations but in reviewing the operation no specific changes are proposed.

vs 21st June 2021

Habitat Regulation Assessment for Proposed Transfer Operations between vessels of:

a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases)
b. Liquid Petroleum Gas
c. Liquid Cargoes (substances consisting wholly or mainly of oil)

LIST OF TABLES

Table A2 – Details of plan or project

Site Name	**Initial Assessment of Risk - potential risk to European Sites (Y/ N/ NA)**
Location	Portland Harbour as defined by the Portland Harbour Revision Order 1997 (https://www.legislation.gov.uk/uksi/1997/2949/contents/made). Transfer operations are proposed for locations shown on **Figure 1.** This also shows designated sites as does **Figures 2** and **3.**
Name of applicant	Portland Harbour Authority Ltd
Description of the plan or project and its constituent elements	Portland Harbour Authority (PHAL) intend to authorise the transfer of cargos between vessels (commonly termed Ship to Ship transfers) within Portland Harbour waters. For the purpose of this Habitat Regulation Assessment the following is proposed: a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and liquid gases) b. Liquid Petroleum Gas c. Liquid Cargoes (substances consisting wholly or mainly of oil)
Has the plan or project, or any aspect of it, already been subject to assessment under the Habitats Regulations by another competent authority?	No

Table A2i.
Activities relevant to Category Transport (ref 3)
i.e. Activities directly involving transport such as vessel movements or relating to the support of transport activities such as vessel moorings.

Category - Transport
ActivityTitle:
8. Cargo operations and landward transportation (amended 10th June 2021)
~~13. Commercial hovercraft~~
~~33. Hovercraft~~
~~101. Vessel anchorages~~
~~102. Vessel berths~~
103. Vessel discharges/emissions
~~104. Vessel maintenance~~
~~105. Vessel moorings~~
106. Vessel movements
In line with feedback from Natural England operations of ports and harbours is applicable

Table A2ii Pressures relevant to all activities associated with Category Transport (ref 3)

Category - Transport
PressureTitle:
~~Abrasion/disturbance of the substrate on the surface of the seabed~~
~~Barrier to species movement~~
Changes in suspended solids (water clarity)
~~Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)~~
Deoxygenation
~~Electromagnetic changes~~
~~Emergence regime changes, including tidal level change considerations~~
~~Genetic modification & translocation of indigenous species~~
~~Habitat structure changes - removal of substratum (extraction)~~
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.
~~Introduction of light~~
~~Introduction of microbial pathogens~~
Introduction of other substances (solid, liquid or gas)
Introduction or spread of invasive non-indigenous species (INIS)
~~Litter~~
~~Nutrient enrichment~~
~~Organic enrichment~~
~~Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion~~
~~Physical change (to another seabed type)~~
~~Physical change (to another sediment type)~~
~~Physical loss (to land or freshwater habitat)~~
~~Radionuclide contamination~~
~~Removal of non-target species~~
~~Removal of target species~~
~~Salinity decrease~~
~~Salinity increase~~
~~Smothering and siltation rate changes (Heavy)~~
~~Smothering and siltation rate changes (Light)~~
~~Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.~~
~~Temperature decrease~~

Table A3i – Designated Sites Location Plans (10th June additions include drawings for SPA and Ramsar)

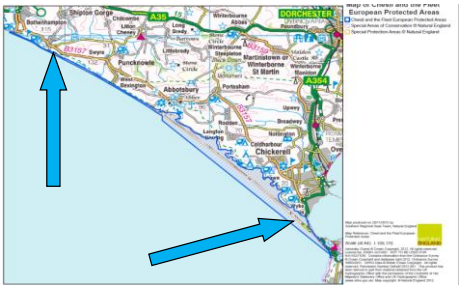
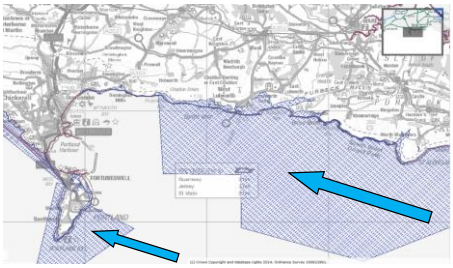
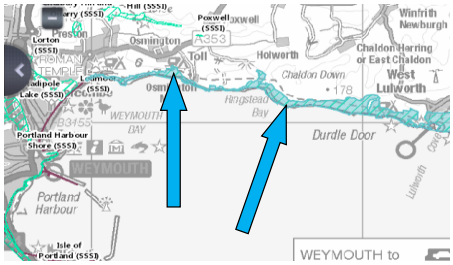
Site Name	Location Plan
Chesil and the Fleet SAC UK0017076	
Chesil Beach and the Fleet SPA UK9010091	
Chesil Beach and the Fleet Ramsar UK11012	
Studland to Portland SAC UK0030382	
Isle of Portland to Studland Cliffs SAC UK0019861	 

Table A3ii – Initial Assessment of Risk Part 1 (see associated Figure in Table A3i)

Site Name	Initial Assessment of Risk - potential risk to European Sites (Y/ N/ NA)
Chesil and the Fleet SAC UK0017076	Yes- This SAC has been included for further screening with the closest part to transfer operations being 1.4 km. This is the Chesil Bank portion of the designated site. The Portland Harbour waterbody and fleet lagoon connects at Ferrybridge (the tidal entrance to the Fleet lagoon) which lies over 2km away from the nearest proposed transfer operations.
Chesil Beach and the Fleet SPA UK9010091	Yes - The SPA is over 2km away from the nearest proposed transfer operations. It is however taken forward for further screening so it can be considered together with the Chesil and the Fleet SAC. Natural England have suggested that Portland Harbour is also potentially used as a foraging area for Little terns (a species registered as a feature of the SPA) so this is acknowledged here.
Chesil Beach and the Fleet Ramsar UK11012	Yes - The Ramsar being over 2km away from the nearest proposed transfer operations. It is however taken forward for further screening so it can be considered together with the Chesil and the Fleet SAC and Chesil Beach and the Fleet SPA.
Studland to Portland SAC UK0030382 Text amended 10th July 2021	Yes - Although the SAC is located over 2km away from the nearest proposed transfer operation location it is included due to potential risk from air quality and a pollution event.
Isle of Portland to Studland Cliffs SAC UK0019861 Text amended 10th July 2021	Yes - This site can be considered in 2 parts: •Isle of Portland - above mean high water therefore considered terrestrial •West Dorset and Purbeck Coast - extends to low water therefore terrestral and marine Both parts are over 2km from the proposed transfer operations at the inner and outer harbour anchorages. The location at Queens Pier is approximately 600m away. It has been included for further screening particularly to take account of air quality considerations.

Table A3iii – Initial Assessment of Risk Part 2

Decision	Conclusion
~~Yes~~	~~o It is clear, without needing to gather any further information, that the whole of this plan or project, throughout all of its life stages, is not capable of having any adverse effect upon a European Site at all and is eliminated from further Habitats Regulations assessment. Permission may be given with respect to European Sites [delete Parts B, C and D, go to Part E]~~
No	There is or may be a credible risk that the plan or project subject to this assessment might undermine the conservation objectives of a European Site. Further Habitats Regulations assessment is therefore necessary [continue to Part B]

Table B – Information about the European Sites that could be affected and associated Conservation Objectives (inclusing supplementary advice)

Natural England Online Site Search

Site Name	Qualifying (Designated) Features Summary	Availability of the Regulation 35 Conservation Advice package	Weblink to Natural England Conservation Objectives	Weblink to supplementary advice for Conservation Objectives	Marine and/ or Terrestrial	Proximity to Transfer operations	Legally Underpinned By
Chesil and the Fleet SAC UK0017076	**EU Habitats Directive Annex I Habitats** •H1150 Coastal lagoons •H1210 Annual vegetation of drift lines •H1220 Perennial vegetation of stony banks •H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) •H1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	**Components include:** •Site information (feature and sub-feature descriptions, site overview, general information about the site and features) •Background information and geography •Site maps •Conservation Objectives •Supplementary advice on conservation objectives •Advice on operations **Additional information for consideration:** •Feature condition •Management measures •Further information	Chesil and the Fleet SAC Conservation Objectives	Chesil and the Fleet SAC supplementary advice	Marine & Terrestrial	The SAC lies within 2km of the proposed transfer operations. The closest part is 1.4 km but this is the Chesil Bank portion. The connection at Ferrybridge (the tidal entrance to the Fleet lagoon) lies over 2km away from the nearest proposed transfer operations.	•Chesil & The Fleet SSSI •Portland Harbour Shore SSSI •West Dorset Coast SSSI
Chesil Beach and the Fleet SPA UK9010091	•Little tern (Sternula albifrons), Breeding •Wigeon (Mareca penelope), Non-breeding	**Components include:** •Site information (feature and sub-feature descriptions, site overview, general information about the site and features) •Background information and geography •Site maps •Conservation Objectives •Supplementary advice on conservation objectives •Advice on operations •Advice on seasonality **Additional information for consideration:** •Feature condition •Management measures •Further information	Chesil Beach and the Fleet SPA Conservation Objectives	Chesil Beach and the Fleet SPA supplementary advice	Marine & Terrestrial	The SPA is over 2km away from the nearest proposed transfer operations.	•Chesil & The Fleet SSSI
Chesil Beach and the Fleet Ramsar UK11012	Ramsar features: • saline lagoon and saltmarsh habitat, • specialist lagoonal, wetland and shingle species, •Bass (Dicentrarchus labrax) (post-larval, juvenile and as nursery habitat), Overwintering Dark-bellied brent goose (Branta bernicla bernicla).	See details for Chesil and the Fleet SAC and Chesil Beach and the Fleet SPA	Conservation Advice statement from Natural England for Chesil Beach and the Fleet Ramsar		Marine & Terrestrial	The Ramsar is over 2km away from the nearest proposed transfer operations.	

Site Name	Qualifying (Designated) Features Summary	Availability of the Regulation 35 Conservation Advice package	Weblink to Natural England Conservation Objectives	Weblink to supplementary advice for Conservation Objectives	Marine and/ or Terrestrial	Proximity to Transfer operations	Legally Underpinned By
Studland to Portland SAC UK0030382	**EU Habitats Directive Annex I Habitats** •H1170 Reefs	**Components include:** •Site information (feature and sub-feature descriptions, site overview, general information about the site and features) •Background information and geography •Site maps •Conservation Objectives •Supplementary advice on conservation objectives •Advice on operations **Additional information for consideration:** •Feature condition •Management measures •Further information	Studland to Portland SAC Conservation Objectives	Studland to Portland SAC supplementary advice	Marine	Although the SAC is located over 2km away from the nearest proposed transfer operation location it is included due to potential risk from a marine pollution event.	•South Dorset Coast SSSI
Isle of Portland to Studland Cliffs SAC UK0019861	**EU Habitats Directive Annex I Habitats** •H1210 Annual vegetation of drift lines •H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts •H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia); •Dry grasslands and scrublands on chalk or limestone **Species listed in Annex II:** •S1654. Gentianella anglica; Early gentian	Conservation Objectives (only available as brief PDF)	Isle of Portland to Studland Cliffs SAC	Isle of Portland to Studland SAC supplementary advive	Considered in 2 parts: •Isle of Portland - above mean high water therefore considered terrestrial •West Dorset and Purbeck Coast - extends to low water therefore terrestral and marine	Both parts are over 2km from the proposed transfer operations at the inner and outer harbour anchorages. The location at Queens Pier is approximately 600m away.	•Chesil & The Fleet SSSI •Isle Of Portland SSSI •Nicodemus Heights SSSI •Purbeck Ridge (East) SSSI •South Dorset Coast SSSI •Studland Cliffs SSSI

Table C1 –

Test 1:
(Is the plan or project either directly connected with or necessary to the (conservation) management (of the European Site's qualifying features)?)

Decision	Conclusion
~~Yes~~	~~As this plan or project is either directly connected with or necessary to the management of all of the European site(s)'s qualifying features, it is considered to be exempt from further Habitats Regulations assessment [go to C3]~~
No	As this plan or project is not either directly connected or necessary to the management of all of the European site(s)'s qualifying features, and/or contains non-conservation elements, further Habitats Regulations assessment is required [continue to C2]

Table C2i –

Risk Assessment (without mitigation) - Part 1 (relevant Features/ Subfeatures and associated attribtues, targets, seasonal considerations and supporting notes)

Source - NE's Supplementary Advice for Conservation Objectives for each site - see weblinks available on Table B)

Feature/ Subfeature name	Attribute	Target	Season	Supporting notes The targets have generally been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
Chesil and the Fleet SAC UK0017076				
Coastal lagoons	Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	N/A	Non-native species may become invasive and displace native organisms by preying on them or out-competing them for resources such as food, space or both. In some cases this has led to the loss of indigenous species from certain areas (Joint Nature Conservation Committee (JNCC), 2004). A pathogen causes disease or illness to its host. Pathogens include bacteria, viruses, protozoa and fungi (Biology-Online, 2008). **Site-specifics:** Invasive species are a concern, such as the Pacific oyster farmed in the east Fleet and proposed in Portland Harbour. The existence of wild settlement and colonisation by this species in these locations is not currently monitored. Japanese wireweed, Sargassum muticum is present in The Narrows but may spread if not contained by suitable management (Natural England (NE), 2014). A red algae Gracilaria vermiculophylla has recently been found in large populations in Dorset: in Christchurch Harbour and on Brownsea Island in Poole Harbour, and its presence may be linked to the cultivation of non-native oysters. It has not yet been found in the Fleet (Maggs and Magill, 2014). Ballast water discharge from vessels also presents a risk as it could potentially result in the introduction of other invasive species.
Coastal lagoons	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	N/A	Contaminants may impact the ecology of the Marine Protected Area by having a range of biological effects on different species within the habitat, depending on the nature of the contaminant (Everett, 1993), (UK Technical Advisory Group on the Water Framework Directive (UKTAG), 2008), (Environment Agency, 2014). Lagoons act as sinks for contaminants from surrounding areas and restricted water exchange means that lagoons are very sensitive to impacts from toxic contamination. Even small quantities of pollutants resulting from the dumping of waste in lagoons can have significant impacts due to the closed nature of lagoonal systems (Everett, 1993). The degree of sensitivity of lagoons to changes in water quality is influenced by the type of communities and species present and by the type of lagoon (ie the nature of the exchange with the sea and the size of the lagoon). **Site-specifics:** Contaminants may have a range of biological effects on different species within the supporting habitat, depending on the nature of the contaminant. This in turn can adversely affect the availability of bird breeding, rearing, feeding and roosting habitats. Typically, meeting the environmental standards set out by WFD will also be sufficient to support the interest features but in some cases more stringent standards may be needed to support particular features (Natural England (NE), 2017). Please note, this target relates to aqueous contaminants, not sediment contaminants.
Coastal lagoons	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	N/A	Water turbidity is a result of material suspended in the water, including sediment, plankton, pollution or other matter washed into the sea from land sources. Lagoons show a high level of inherent environmental variability in both space and time which is not a feature of other aquatic habitats, including turbidity (Bamber, 2010). In coastal environments turbidity levels can rise and fall rapidly as a result of biological (eg plankton blooms), physical (eg storm events) or human (e.g. coastal development) factors. However lagoons are generally sheltered habitats, with associated low levels of turbidity. Prolonged changes in turbidity may influence the amount of light penetration, affecting the primary production and nutrient levels of the habitat's associated communities. Water clarity can be a useful indicator in lagoons. Changes in turbidity may also have a range of biological effects on different species within the habitat, eg affecting their abilities to feed or breathe (Joint Nature Conservation Committee (JNCC), 2004). **Site-specifics:** In 2000, turbidity was fairly constant at a low level, with the exception of a few groups of peaks of up to 600 NTU (Nephelometric Turbidity Units). These groups of peaks corresponded to disruptions to the tidal and diurnal variations in salinity and dissolved oxygen (Johnson and Gilliland, 2000). The target has been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Supporting processes: air quality	Maintain concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System	N/A	This target has been included because this habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH_3), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as halogens, heavy metals, persistent organic pollutants (POPs), volatile organic compounds (VOCs) or dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant, but flux-based critical levels for the protection of semi-natural habitats are still under development. > More information about site-relevant Critical Loads and Levels for this site is available by using the 'search by site' tool on the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2014). It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. **Site-specifics:** The site-relevant critical load of nitrogen for this feature in the Chesil and the Fleet SAC is 20-30 kg N/ha/yr. With a maximum deposition of 16.1 kg N/ha/yr, nitrogen deposition is currently below the site-relevant critical load for ecosystem protection (Centre for Ecology & Hydrology (CEH), 2017). The target has been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	Supporting processes: air quality	Maintain the range of the habitat and natural transitions within saltmarsh types and to other habitats seaward and landward, and do not cause fragmentation of existing stands.	N/A	This target has been included because a contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations that are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat that will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature. **Site-specifics:** This community is found in a narrow strip at the extreme high water mark and in depressions, extending onto shingle. Along the landward shore of Chesil Beach, a 1-4 m wide band of Mediterranean and thermo-Atlantic halophilous scrubs, occasionally with inundation hollows of Atlantic salt meadow (SM14), may merge with SD1 pioneer shingle vegetation or MC5 shingle grassland, both characteristic of perennial vegetation of stony banks (Groome and Crowther, 2005). Shrubby sea-blite Suaeda vera should be abundant along the landward shore of Chesil Beach. The target has been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
Perennial vegetation of stony banks	Supporting processes: air quality	Restore concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System	N/A	This target has been included because this habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH_3), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as halogens, heavy metals, persistent organic pollutants (POPs), volatile organic compounds (VOCs) or dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. More information about site-relevant Critical Loads and Levels for this site is available by using the 'search by site' tool on the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2014). It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. (Remke, 2010) **Site-specifics:** The site-relevant critical load of nitrogen for this feature in the Chesil and The Fleet SAC is 8-15 kg N/ha/yr. With a maximum deposition of 16.1 kg N/ha/yr, nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects (Centre for Ecology & Hydrology (CEH), 2017). The impact of air pollution could also be a contributing factor to poor water quality (Natural England (NE), 2014). There is evidence from survey or monitoring to suggest that aerial nitrogen deposition exceeds site relevant critical loads for these features.
Chesil Beach and the Fleet SPA UK9010091				
Wigeon (Mareca penelope), Non-breeding	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	Year-round	Contaminants may have a range of biological effects on different species within the supporting habitat, depending on the nature of the contaminant (Joint Nature Conservation Committee (JNCC), 2004), (UK Technical Advisory Group on the Water Framework Directive (UKTAG), 2008), (Environment Agency, 2014). This in turn can adversely affect the availability of bird breeding, rearing, feeding and roosting habitats, and potentially bird survival. **Site-specifics:** Please note, this target relates to aqueous contaminants, not sediment contaminants.
Wigeon (Mareca penelope), Non-breeding	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year, avoiding deterioration from existing levels.	Year-round	Dissolved Oxygen (DO) levels affect the condition and health of supporting habitats. Excessive nutrients and/or high turbidity can lead to a drop in DO, especially in warmer months. Low DO can have sub-lethal and lethal impacts on fish and infauna and epifauna communities (Best et al., 2007) and hence can adversely affect the availability and suitability of bird breeding, rearing, feeding and roosting habitats. However, there is a significant amount of natural variation that should be considered. **Site-specifics:** Dissolved oxygen levels throughout the Fleet are generally above 8 mg/l in spring/summer and regularly exceed 10 mg/l in autumn/winter (Whittaker, 1978), (Data.gov.uk, 2017), (Environment Agency Marine Monitoring Service, 2014). There is evidence from survey or monitoring that shows the feature to be in a good condition and/or currently un-impacted by anthropogenic activities.

Feature/ Subfeature name	Attribute	Target	Season	Supporting notes The targets have generally been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
Wigeon (Mareca penelope), Non-breeding	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Year-round	Water turbidity is a result of material suspended in the water, including sediment, plankton, pollution or other matter from land sources. Turbidity levels can rise and fall rapidly as a result of biological (eg plankton blooms), physical (eg storm events) or human (eg development) factors. Prolonged changes in turbidity may influence the amount of light reaching supporting habitats, affecting the primary production and nutrient levels of the habitat's associated communities. Changes in turbidity may also have a range of biological effects on different species within the habitat, eg affecting their abilities to feed or breathe. A prolonged increase in turbidity is indicative of an increase in suspended particulates. This has a number of implications for the aquatic / marine environment, such as affecting fish health, clogging the filtering organs of suspension feeding animals and affecting sedimentation rates. This in turn can adversely affect the availability and suitability of bird breeding, rearing, feeding and roosting habitats. **Site-specifics:** In 2000, turbidity was fairly constant at a low level, with the exception of a few groups of peaks of up to 600 NTU (Nephelometric Turbidity Units). These groups of peaks corresponded to disruptions to the tidal and diurnal variations in salinity and dissolved oxygen (Johnson and Gilliland, 2000).
Wigeon (Mareca penelope), Non-breeding	Supporting habitat: air quality	Maintain concentrations and deposition of air pollutants at below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	Year round – to ensure the habitat remains suitable for when the feature is present	This target has been included because the structure and function of habitats which support this SPA feature may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of its habitat substrate, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of nesting, feeding or roosting habitats. Critical Loads and Levels are thresholds below which such harmful effects on sensitive UK habitats will not occur to a noteworthy level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. More information about site-relevant Critical Loads and Levels for this site is available by using the 'search by site' tool on the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2014). It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. **Site specifics** The site-relevant critical load of Nitrogen for supporting habitat of this feature is 20-30 kg N/ha/yr .With a maximum deposition for littoral sediment of 13.86 kg N/ha/yr, nitrogen deposition is currently below the site-relevant critical load for ecosystem protection (Centre for Ecology & Hydrology (CEH), 2017). The target has been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
Little tern (Sternula albifrons), Breeding	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	Year-round	same as for Widgeon above
Little tern (Sternula albifrons), Breeding	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year, avoiding deterioration from existing levels.	Year-round	same as for Widgeon above
Little tern (Sternula albifrons), Breeding	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Year-round	same as for Widgeon above
Little tern (Sternula albifrons), Breeding	Supporting habitat: air quality	Maintain concentrations and deposition of air pollutants at below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	Year round – to ensure the habitat remains suitable for when the feature is present	same as for Widgeon above **Site specifics** For shingle beach drifflines and open shingle vegetation, there is no sensitivity to Nitrogen deposition as a critical level. There is very little known about Nitrogen effects on these shingle communities. It is assumed they behave in a similar way to acidic dune communities (shingle is usually acidic), but note that moisture is strongly limiting and may moderate Nitrogen responses in early successional shingle habitats. However, shingle may be equated to coastal stable dune grasslands - acid type, the critical load for which is 8-10 kg N/ha/yr (Centre for Ecology & Hydrology (CEH), 2014). Using the 5 km grid squares, provided by APIS, showing concentration and deposition values across the whole site, the 5 km grid square containing the breeding colony has Nitrogen deposition below 10 kg/ha/yr at between 8.4-9.9 kg/ha/yr (Centre for Ecology & Hydrology (CEH), 2014). If the critical load of Nitrogen for the supporting habitat of this feature (supralittoral sediment) is applied instead, the deposition is still below 10-20 kg N/ha/yr. (Centre for Ecology & Hydrology (CEH), 2017). There is evidence from survey or monitoring that shows the feature to be in a good condition and/or currently un-impacted by anthropogenic activities.
Chesil Beach and the Fleet Ramsar UK11012				
See details for Chesil and the Fleet SAC and Chesil Beach and the Fleet SPA				
Studland to Portland SACUK0030382				
Reefs	Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	N/A	Non-native species may become invasive and displace native organisms by preying on them or out-competing them for resources such as food, space or both. In some cases this has led to the loss of indigenous species from certain areas (Joint Nature Conservation Committee (JNCC), 2004). A pathogen causes disease or illness to its host. Pathogens include bacteria, viruses, protozoa and fungi (Biology-Online, 2008). **Site-specifics:** The following non-native species have been recorded in the site Sargassum muticum (wireweed), Undaria pinnatifida (wakame), Anotrichium furcellatum (red alga), Asparagopsis armata (harpoon weed), Bonnemaisonia hamifera (Bonnemaison's hook weed), Heterosiphonia japonica (red alga), Solieria chordalis (red alga), Colpomenia peregrina (oyster thief), Styela clava (leathery sea squirt), Crepidula fornicata (slipper limpet), Calliostoma zizyphinum (painted top shell) (Seasearch, 2015), (Seasearch, 2014), (National Biodiversity Network, 2017). Possible records of the Didemnum vexillum (carpet sea squirt) have occurred in the site but are currently not substantiated (Dewey et al., 2011). The National Biodiversity Network (NBN) Gateway does not currently record Didemnum vexillum in the SAC (National Biodiversity Network, 2017). Other non-native species have been recorded in neighbouring protected sites such as Lyme Bay and Torbay SAC. These non-native species have the potential to spread into the Studland to Portland SAC in the future.
Reefs	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	N/A	Contaminants may impact the ecology of the Marine Protected Area by having a range of biological effects on different species within the habitat, depending on the nature of the contaminant (Joint Nature Conservation Committee (JNCC), 2004), (UK Technical Advisory Group on the Water Framework Directive (UKTAG), 2008), (Environment Agency, 2014). **Site-specifics:** EA regularly monitors the Dorset Hampshire water body which overlaps the Studland to Portland SAC for aqueous contaminants, dissolved oxygen and nutrients. There is no Environment Agency data available for the west side of the Portland section of the MPA. Environment Agency data from the east side of the Portland section and from the Ringstead to Studland reefs section shows that there are no aqueous contaminants affecting this part of the site.
Reefs	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	N/A	Water turbidity is a result of material suspended in the water, including sediment, plankton, pollution or other matter washed into the sea from land sources. In coastal environments turbidity levels can rise and fall rapidly as a result of biological (eg plankton blooms), physical (eg storm events) or human (eg coastal development) factors. Prolonged changes in turbidity may influence the amount of light reaching the seabed, affecting the primary production and nutrient levels of the habitat's associated communities. Changes in turbidity may also have a range of biological effects on different species within the habitat, eg affecting their abilities to feed or breathe (Joint Nature Conservation Committee (JNCC), 2004). **Site-specifics:** Algal species have been recorded down to 25m (Cork et al., 2008).
Isle of Portland to Studland Cliffs SAC UK0019861 **(Conservation objectives and supplementary advice only available as pdf and not possible at time of assessment to interrogate Natural England's designated sites database)**				

Feature/ Subfeature name	Attribute	Target	Season	Supporting notes The targets have generally been set using expert judgement based on knowledge of the sensitivity of the feature to activities that are occurring / have occurred on the site.
H1230. Vegetated sea cliffs of the Atlantic and Baltic coasts	Supporting processes (on which the feature relies) Air quality	Concentrations and deposition of air pollutants should be maintained at or below the siterelevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of seminatural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. Critical loads for this feature within the SAC are currently within acceptable limits however there are concerns about impacts of future increases in deposition levels on the feature. Any proposals within 10km of the St Albans Head to Durlston Head SAC should be assessed for their air quality impacts on the feature. Site specific critical loads and levels for features can be found here: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0019863&SiteType=SAC&submit=Next. More information about siterelevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk). Site specific critical loads and levels for features can be found here Site Improvement Plan: PortlandStudland & St Albans-Durlston (SIP178) Note that as the Vegetated sea cliffs of the Atlantic and Baltic Coasts (H1230) comprises a variety of vegetation communities, it would be necessary to assess emissions against each NVC (National Vegetation Classification) community (see above) listed for this feature separately. This can be done here: http://www.apis.ac.uk/search-pollutant-impacts.
H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (important orchid sites)	Supporting processes (on which the feature relies) Air quality	Concentrations and deposition of air pollutants should be maintained at or below the siterelevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		Same as for H1230 Vegetated sea cliffs of Atlantic and Baltic coasts. See also note below. Note that as the H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia) (important orchid sites) comprises a variety of vegetation communities, it would be necessary to assess emissions against each NVC (National Vegetation Classification) community (see above) listed for this feature separately. This can be done here: http://www.apis.ac.uk/search-pollutant-impacts.
S1654. Gentianella anglica; early gentian	Supporting processes (on which the feature relies) Air quality	Concentrations and deposition of air pollutants should be maintained at or below the siterelevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		As above except see note below. The S1654. Gentianella anglica; Early gentian feature is found within a series of vegetation communities, it would be necessary to assess emissions against each NVC (National Vegetation Classification) community (see above) listed for this feature separately. This can be done here: http://www.apis.ac.uk/search-pollutant-impacts

Table C2ii – Risk Assessment (without mitigation) - Part 2 (Risk of significant effects alone or in-combination and its mechanism/ pathway and reason)

Designated Site(s): "Chesil and the Fleet SAC", "Chesil Beach and the Fleet SPA", "Chesil Beach and the Fleet Ramsar", "Studland to Portland SAC" and "Isle of Portland to Studland Cliffs SAC"

Relevant Features/ Sub-features
Habitat - Coastal Lagoon, Reefs, Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi),
H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia);

Species - Widgeon (Mareca penelope) - Non-breeding, Little tern (Sternula albifrons) - Breeding, S1654. Gentianella anglica; Early gentian

Attribute	Target	Relevant Feature/ Subfeature	Risk of Significant Effects (without incorporating any mitigation) (Alone) and its mechanism/ pathway Yes/ No/ Uncertain and reason for decision	Risk of Significant Effects (without incorporating mitigation) (In-combination) and its mechanism/ pathway Y/N/ Uncertain/ NA and reason for decision
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	**Habitat** Coastal Lagoon, Reefs, Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi), ~~H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia).~~ **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding ~~S1654. Gentianella anglica; early gentian~~	Yes. Potential direct and indirect risks of introduction and spread of non-native species and pathogens, and their impacts in connection with ballast water management associated with 3 projects relating to transfer operations between vessels: a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases) b. Liquid Petroleum Gas c. Liquid Cargoes (substances consisting wholly or mainly of oil)	N/A
Supporting processes/ habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	**Habitat** Coastal Lagoon, Reefs, Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi), ~~H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia).~~ **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding ~~S1654. Gentianella anglica; early gentian~~	Yes. Potential direct and indirect risks of introducing aqueous contaminants in connection with a pollution event associated with 3 projects relating to transfer operations between vessels: a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases) b. Liquid Petroleum Gas c. Liquid Cargoes (substances consisting wholly or mainly of oil)	N/A

Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year, avoiding deterioration from existing levels.	**Habitat** Coastal Lagoon, Reefs, Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi), ~~H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia).~~ **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding ~~S1654. Gentianella anglica; early gentian~~	Yes. Potential direct and indirect risks of introducing aqueous contaminants in connection with a pollution event associated with 3 projects relating to transfer operations between vessels: a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases) b. Liquid Petroleum Gas c. Liquid Cargoes (substances consisting wholly or mainly of oil)	N/A
Supporting processes/ habitat: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	**Habitat** Coastal Lagoon, Reefs, Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi), ~~H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia).~~ **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding ~~S1654. Gentianella anglica; early gentian~~	Yes. Potential direct and indirect risk of changing turbidity in connection with a pollution event associated with 3 projects relating to transfer operations between vessels: a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases) b. Liquid Petroleum Gas c. Liquid Cargoes (substances consisting wholly or mainly of oil)	N/A
Supporting processes (on which the feature relies) Air quality	Concentrations and deposition of air pollutants should be maintained at or below the siterelevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	**Habitat** ~~Coastal Lagoon, Reefs,~~ Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi), H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia). **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding S1654. Gentianella anglica; early gentian	Yes. Potential direct and indirect risk of air emissions in connection with normal product transfer associated with 3 projects relating to transfer operations between vessels: a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases) b. Liquid Petroleum Gas c. Liquid Cargoes (substances consisting wholly or mainly of oil)	N/A

Table C2iii - Test 2:
In light of sections C1 and C2 of this assessment above, the following is concluded:

Decision	Conclusion
NO	~~As this plan or project is either directly connected with or necessary to the management of all the qualifying features of the European Site(s), no further Habitats Regulations assessment is required [delete Part D and go to Part E]~~
	OR
NO	~~As this plan or project is unlikely to have significant effects (either alone or in combination with other plans or projects) on any Qualifying Features of the European Site(s), no further Habitats Regulations assessment is required [delete Part D and go to Part E]~~
	OR
YES	As this plan or project ~~is likely to have significant effects (or~~ may have significant effects) on some or all of the Qualifying Features of the European Site(s) 'alone', further Habitats Regulations assessment of the project 'alone' is required [go to Part D].
	AND/ OR
NA	~~As this plan or project is likely to have significant effects (or may have significant effects) on some or all of the Qualifying Features of the European Site(s) 'in combination' with other plans or projects further Habitats Regulations assessment is required [go to Part D].~~

Table D3 – Appropriate Assessment (with mitigation)

Designated Site(s): "Chesil and the Fleet SAC", "Chesil Beach and the Fleet SPA", "Chesil Beach and the Fleet Ramsar", "Studland to Portland SAC" and "Isle of Portland to Studland Cliffs SAC"

Relevant Features/ Sub-features

Habitat - Coastal Lagoon, Reefs, Atlantic salt meadows (Glauco-Puccinellietalia maritimae), Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi),

H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia);

Species - Widgeon (Mareca penelope) - Non-breeding, Little tern (Sternula albifrons) - Breeding, S1654. Gentianella anglica; Early gentian

Attribute	Target	Relevant Feature/ Subfeature	Analysis of additional measures that can avoid or reduce the effects on the attribute	D3.1 Risk of Significant Effects (considering any incorporated mitigation) (Alone)	D3.1 Risk of Significant Effects (considering any additional mitigation) (Alone)	D4.1 Risk of Significant Effects (considering any incorporated mitigation) (In-combination)	D4.1 Risk of Significant Effects (considering any additional mitigation) (In-combination)	Conditions or restrictions to be applied	Residual Effects
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	**Habitat** Coastal Lagoon reefs **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding	The following measures have been identified for projects (a), (b) and (c) **MITIGATION/ MEASURES** applicable to all projects See Appendix A for overview. In the case of the Oil Transfer Application these documents are included as appendices to the Environmental Statement. They are the same for all 3 projects. Included in the measures are the following **GENERAL DIRECTIONS 1-3** General Directions (made under article 16 of The Portland Harbour Revision Order 1997 https://www.legislation.gov.uk/uksi/1997/2949/article/16/made)* Transfer of Liquid Cargoes excluding Oil and Liquified Gases between Vessels (GD No. 1 of 2020) – applicable to Project (a)* Transfer of Liquid Petroleum Gases between Vessels (GD No. 2 of 2020) – applicable to Project (b) Transfer of Liquid Cargoes consisting of Oil between Vessels (GD No. 3 of 2020) – applicable to Project (c)	It can be ascertained that for this application 'no adverse effect' because of the measures described in column E.	NA	It can be ascertained that for this application 'no adverse effect' because of the measures described in column E.	NA	Implementation and compliance with the measures described in column E.	None
Supporting processes/ habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	**Habitat** Coastal Lagoon Reefs **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding							
Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year, avoiding deterioration from existing levels.	**Habitat** Coastal Lagoon Reefs **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding							
Supporting processes/ habitat: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	**Habitat** Coastal Lagoon Reefs **Species** Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding							
Supporting processes (on which the feature relies) Air quality	Concentrations and deposition of air pollutants should be maintained at or below the sterelevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	**Habitat** H1210 Annual vegetation of drift lines, H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts, H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (FestucoBrometalia). **Species** S1654. Gentianella anglica; early gentian, Widgeon (Mareca penelope) - Non-breeding Little tern (Sternula albifrons) - Breeding							

Table D5 – Conclusions on Site Integrity

Decision	Conclusion
NO	~~It can be ascertained that this plan or project will not have an adverse effect on the integrity of the following site(s), either alone or in combination with other plans and projects; a permission can be given without conditions~~ ~~[Insert site(s) as appropriate]~~
YES	It can be ascertained that this plan or project will not have an adverse effect on the integrity of the following site(s), either alone or in combination with other plans and projects, subject to restrictions and/or conditions a permission can be given with conditions ~~[Insert site(s) as appropriate]~~
NO	~~It cannot be ascertained that this plan or project will not have an adverse effect on the integrity of the following site(s) for the following reasons; a permission cannot be given at this stage~~ ~~[Insert site(s) as appropriate]~~

Table E – Permission decision with respect to European Sites

Decision	Conclusion
NO	~~Consent/Permission/Assent/Licence/Authorisation may be given*~~
Yes	Consent/Permission/Assent/Licence/Authorisation may be given but only subject to the strict implementation of the following conditions or restrictions*: [Prior to transfer operations commencing for Projects (a), (b) and (c), the measures described in this Habitat Regulation Assessment shall be implemented in each case]
N/A	~~Consent/Permission/Assent/Licence/Authorisation may not be given (subject to regulation 64 ('consideration of imperative reasons of overriding public interest')~~

Date: 10th July 2020
Our ref: 319574
Your ref:

Sandie Wilson
Environment and Planning Manager
Environment Dept
Portland Port

Ground Floor
Sterling House
Dix's Field
Exeter
EX1 1QA

VIA EMAIL ONLY

Dear Sandie

Transfer operations of liquid cargo between vessels at Portland Port (Weymouth)

c) Liquid Cargoes (substances consisting wholly or mainly of oil)

The locations of the proposed operations is sited in close proximity to the following:
Chesil & The Fleet Special Area of Conservation (SAC)
Chesil Beach & The Fleet Special Protection Area (SPA)
Chesil Beach & The Fleet Wetland Area of International Importance under the Ramsar Convention (Ramsar site)
Chesil & The Fleet Site of Special Scientific Interest (SSSI)
Studland to Portland SAC
Isle of Portland to Studland Cliffs SAC
Isle of Portland SSSI
Portland Harbour Shore SSSI

Thank you for your consultation dated 15th June 2020. The following constitutes Natural England's formal statutory response.

Habitats Regulation Assessment

The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017

We can confirm that the proposed works are located adjacent to the above listed SACs, SPA and Ramsar site.

General comments on the HRA

Table A2i. Activities relevant to Category Transport (ref 3)
This table considers Vessel discharges/emissions and Vessel movements activities. For completeness, we would also recommend the inclusion of the following relevant activities from the Advice on Operations in the Conservation Packages for the European sites listed above:

- Ports & Harbours Operations
  - → Cargo operations and landward transport
  - → Operations of ports and harbours

The pressures are the same as those already considered, so no additional consideration is required.

Table A3i – Designated Sites Location Plans

Under Location Plan heading for Chesil Beach and the Fleet SPA and Ramsar, it states "*see Chesil and the Fleet SAC*". The SPA and Ramsar have a different footprint to the SAC, therefore we would advise including a map of the SPA and referring to that for the Ramsar.

Screening

Natural England notes that your authority, as competent authority under the provisions of the Habitats Regulations, has screened the proposal to check for the likelihood of significant effects.

Your assessment concludes that your authority cannot rule out the likelihood of significant effects arising from the proposal, either alone or in-combination, for the following sites: Chesil and the Fleet SAC, Chesil Beach and the Fleet SPA, Chesil Beach and the Fleet Ramsar and Isle of Portland to Studland Cliffs SAC. It further concludes that the proposal can be screened out from further stages of assessment because significant effects are unlikely to occur, either alone or in combination, for the following site: Studland to Portland SAC. On the basis of the information provided, Natural England concurs with this view.

However, in Table A3ii the justifications for excluding the Studland to Portland SAC from any further assessment are its distance from the proposed transfer locations (although it is within 2km), and that it is marine habitat only. Natural England does not agree that the latter is justification for screening out this site at this stage; the biotopes associated with the reef feature may be sensitive to the pressures associated with the proposed operations if they were closer to the site. Therefore, the justification of distance, coupled with the physical barrier of the Isle of Portland, would be the reason for excluding this site from further assessment. Also, in the same table, Isle of Portland to Studland Cliffs SAC is stated as being over 2km from the nearest proposed transfer location. The nearest part of this SAC is approximately 600m away from the transfer berths along Queens Pier. Please note, these comments do not affect our agreement with the outcome of the screening.

Appropriate assessment

Natural England notes that your authority, as competent authority, has undertaken an appropriate assessment of the proposal in accordance with Regulation 63 of the Conservation of Species and Habitats Regulations 2017. Natural England is a statutory consultee on the appropriate assessment stage of the Habitats Regulations Assessment process.

Your appropriate assessment concludes that your authority is able to ascertain that the proposal will not result in adverse effects on the integrity of any of the sites in question. Having considered the assessment, and the measures proposed to mitigate for all identified adverse effects that could potentially occur as a result of the proposal, Natural England advises that we concur with the assessment conclusions, providing that all mitigation measures are appropriately secured.

Nature Conservation Review

Marine and Coastal Access Act 2009

The proposed operations, as set out in the information supplied by Portland Harbour Authority Limited, are within 2km of the Chesil Beach and Stennis Ledges Marine Conservation Zone but due to the physical barrier of the Isle of Portland and the Chesil bank, there is no identified pathway. Therefore, Natural England advises that we concur with the review conclusions, providing that all mitigation measures are appropriately secured.

Wildlife and Countryside Act 1981 (as amended)

We can confirm that the proposed works are located within 2km of the Chesil and the Fleet SSSI and Portland Harbour Shore SSSI. Natural England advises that we concur with the review conclusions that the proposal, if undertaken in strict accordance with the mitigation details submitted, is not likely to damage the interest features for which the site has been notified.

Protected Species under Schedule 5

Regarding the assessment of potential impacts of the proposed operations on the lagoon sand worm *Armandia cirrhosa* and spiny seahorse *Hippocampus guttulatus*, Natural England concur with the review conclusions that the proposal, if undertaken in strict accordance with the mitigation details submitted, is not likely to damage these Schedule 5 species.

Natural Environment and Rural Communities Act 2006

Habitats of Principal Importance under Section 41

Regarding the assessment of potential impacts of the proposed operations on the Seagrass Beds and the Mud Habitats in Deep Water (including the OSPAR habitat, Seapens and burrowing megafauna in circalittoral fine mud), Natural England concur with the review conclusions that the proposal, if undertaken in strict accordance with the mitigation details submitted, is not likely to damage these Habitats of Principal Importance.

For any queries relating to the content of this letter please contact me using the details provided below.

Yours sincerely,

Maxine Chavner
Marine Lead Adviser,
Dorset Coast, Wessex Team
Natural England
Tel: 07775 410185
Email: Maxine.Chavner@naturalengland.org.uk

Appendix 5.2 – Nature Conservation Review

Nature Conservation Review

for the proposed

Transfer of Liquid Cargoes between vessels

(Projects (a), (b) and (c))

version 21st June 2021

(Updated to references to documentation specifically mitigation/ measures and General Directions)

1. Introduction

Overview

This technical note documents a Nature Conservation Review (NCR) for 3 projects relating to transfer operations between vessels as follows:

a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases)
b. Liquid Petroleum Gas
c. Liquid Cargoes (substances consisting wholly or mainly of oil)

For the purpose of defining oil, the definition in The Ship to Ship Regulations 2020 is used which defines this to be "oil of any description and includes spirit produced from oil of any description, and also includes coal tar". This definition is the same as that in the Merchant Shipping Act 1995.

Our conclusion having undertaken a "Nature Conservation Review" is that the project will not have a significant effect on any designated sites or species and in reaching this conclusion are now consulting Natural England to seek confirmation they are in agreement. This document sets out the assessment and in doing so refers to relevant supporting documentation/ measures.

In considering our assessment for each of the 3 projects and responding in writing it would be helpful if Natural England could respond individually to each project i.e. providing a separate letter for each. This helps with the administrative aspects of managing transfer operations going forward.

Assessment

The assessment comprises the following parts:

1	Introduction
2	Marine & Coastal Access Act 2009
3	Wildlife and Countryside Act 1981 (as amended)
4	Habitats of Principal Importance/ Priority Habitat
5	Details of the Plan, Activities and Pressures
6	Mitigation/ Measure

Figure 1-3 are also included as follows:

- **Figure 1** shows locations where transfer operations are proposed
- **Figure 2** shows Marine Protected Areas (Harbour view)
- **Figure 3** shows Marine Protected Areas (wide view)

A primary source of information is sourced from the following website: https://designatedsites.naturalengland.org.uk/SiteSearch.aspx.

Documentation

The documentation is packaged in 3 parts (i, ii and iii) as follows:

i. **Habitat Regulation Assessment and Nature Conservation Review**

- Nature Conservation Review and associated tables (this document)
- Habitat Regulation Assessment and associated tables (for European Designations)

ii. **Mitigation/ Measures**

- See **Appendix A** for overview. In the case of the Oil Transfer Application these documents are included as appendices to the Environmental Statement. They are the same for all 3 projects.

iii. **General Directions** (made under article 16 of The Portland Harbour Revision Order 1997 https://www.legislation.gov.uk/uksi/1997/2949/article/16/made)*

1. Transfer of Liquid Cargoes excluding Oil and Liquified Gases between Vessels (GD No. 1 of 2020) – **applicable to Project (a)"**
2. Transfer of Liquid Petroleum Gases between Vessels (GD No. 2 of 2020) – **applicable to Project (b)**
3. Transfer of Liquid Cargoes consisting of Oil between Vessels (GD No. 3 of 2020) – **applicable to Project (c)**

**Please note the definition for oil in the case of the General Directions is different than for the 3 projects. Further explanation including in supporting Document A (Guide to Transfer Operation).*

2. Marine & Coastal Access Act 2009

Chesil Beach and Stennis Ledges Marine Conservation Zone is located within 2km of the proposed site however the Chesil Beach forms a physical barrier between the MCZ and Portland Harbour. There is therefore no marine pathway by which activities potentially associated with the proposed Transfer Operations could have an impact. Any operations in connection with Projects (a), (b) and (c) would not hinder the conservation objectives of such a site because of its marine nature. The location of the MCZ in relation to Portland Harbour is shown in **Figure 2i** below and information about the site is included in **Table A** at the end of this document.

Figure 2i. Chesil Beach and Stennis Ledges Marine Conservation Zone in relation to Portland Harbour

Marine Conservation Zones (MCZs)	
Chesil Beach & Stennis Ledges MCZ	

3. Wildlife and Countryside Act 1981 (as amended)

The following series of tables include details of Sites of Special Scientific Interest (SSSI's) and their proximity to Portland Harbour.

Figure 3i. Chesil & The Fleet SSSI

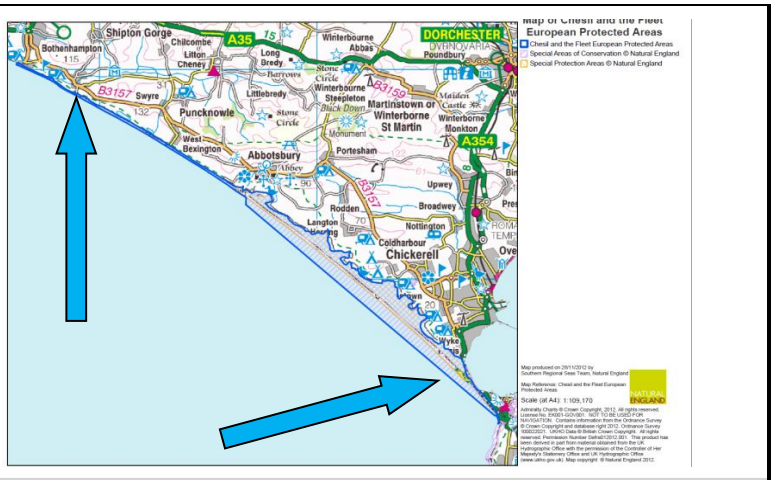
Chesil & The Fleet SSSI (See also Chesil & Fleet SAC)	

Figure 3ii. Portland Harbour Shore SSSI

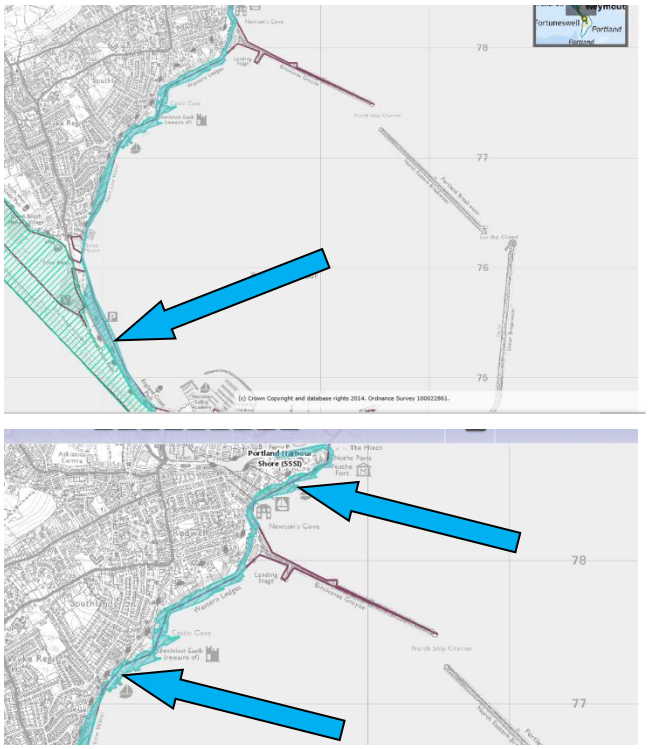
Portland Harbour Shore SSSI	

Figure 3iii. South Dorset SSSI

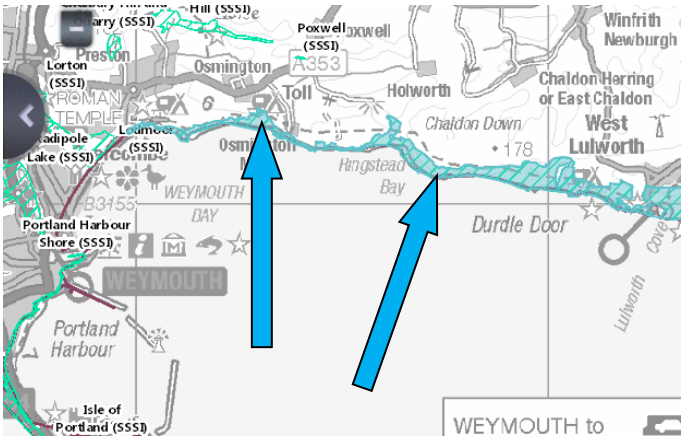
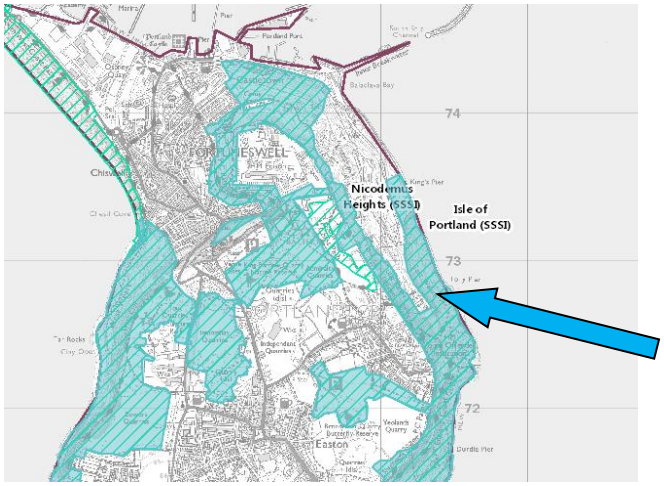
South Dorset SSSI **(See also Isle of Portland to Studland Cliffs SAC)**	

Figure 3iv. Isle of Portland SSSI

Isle of Portland SSSI (See also Isle of Portland to Studland Cliffs SAC)	

Further details on the above Sites of Special Scientific Interest can also be found in **Table A.**

Armandia cirrhosa, Lagoon Sandworm (https://www.marlin.ac.uk/species/detail/1160), and the Long Snouted (or Spiny) Seahorse *Hippocampus guttulatus* (https://www.marlin.ac.uk/species/detail/1891), are present in Portland Harbour. Further details are included in **Table A.** Both species are protected under Schedule 5, Section 9 of the Wildlife and Countryside Act 1981 (as amended). They are also a Species of Principal Importance in England.

In the case of the SSSI's and protected species mentioned above there are potential pathways by which an activity associated with this proposed transfer operations could have an impact.

4. Habitats of Principal Importance/ Priority Habitat

Seagrass beds (Zostera spp.) is listed on Section 41 of the Natural Environment and Rural Communities Act 2006 as Habitats of Principal Importance for Conservation of Biodiversity in England, and on the OSPAR list of threatened and/or declining habitats in need of protection are also a consideration. Further details on this habitat is included in **Table A**.

Philine aperta and Virgularia mirabilis in soft stable infralittoral mud (SS.SMu.IFiMu.PhiVir) and Seapens and burrowing megafauna in circalittoral fine mud (SS.SMu.CFiMu.SpnMeg) are also located within the harbour. The relevant Habitat of Principal Importance/ Priority Habitat f potential relevance, 'Mud habitats in deep water' are a Habitat of Principal Importance.

Data from the Dorset Wildlife Trust for the habitats discussed above can be found at **Appendix A.**

In the case of the above habitats there are potential pathways by which an activity associated with this proposed Transfer operation could have an impact which are discussed in the next section.

5. Details of the Plan, Activities and Pressures

Table B includes a list of tables from the Habitat Regulations Assessment (HRA) that are also relevant to this nature conservation review. This report should therefore be read in conjunction with the HRA.

Table B – List of tables from the Habitat Regulations Assessment that are also relevant to the Nature Conservation Review	
Part A	
Table A2	Details of the plan or project
Table A2i	Activities relevant to Category Transport (ref 3)
Table A2ii	Pressures relevant to activities associated with Category Transport (ref 3)

In terms of an explanation, the following points are relevant:

- **Table A2**
  - Includes details about what in this case is considered to be a 'Plan'.
- **Table A2i, A2ii, A2iii and A2iv –**
  - the 'JNCC Pressures-Activities Database' (see http://jncc.defra.gov.uk/default.aspx?page=7136) has been consulted in order to populate these tables
  - the following categories have been identified as being relevant to transfer operations between vessels:
    - Transport
  - 'Activities' relevant to each of these categories are listed in **Tables A2i**
  - 'Pressures' relevant to these activities have also been listed and can be found in **Tables A2ii**
  - In the case of both activities and pressures the complete list is provided however where they are not relevant strikethrough has been used to demonstrate this is the case.

6. Mitigation/ Measures

- In undertaking the necessary navigational risk assessment, creating standard operating procedures and putting local regulations in place prior to Projects (a), (b) and (c) commencing, 'no adverse effect' on the designated sites can be concluded.
- These additional measures avoid or reduce the effects on the attributes
  - See **Appendix B** for an overview of what these are. In the case of the Oil Transfer Application these documents are included as appendices to the Environmental Statement. They are the same for all 3 projects.
  - **GENERAL DIRECTIONS 1-3* and applicability to projects are as follows:**
    - Transfer of Liquid Cargoes excluding Oil and Liquified Gases between Vessels (GD No. 1 of 2020) – **applicable to Project (a)"**
    - Transfer of Liquid Petroleum Gases between Vessels (GD No. 2 of 2020) – **applicable to Project (b)**

- Transfer of Liquid Cargoes consisting of Oil between Vessels (GD No. 3 of 2020) – **applicable to Project (c)**

**General Directions (made under article 16 of The Portland Harbour Revision Order 1997 https://www.legislation.gov.uk/uksi/1997/2949/article/16/made)*

- Of relevance to ballast water management and air quality paragraphs 13 and 14 of each General Direction apply.

- In our opinion, it can be ascertained that Projects (a), (b) and (c) will not have an adverse effect on the integrity of the sites and species discussed in the NRA, either alone or in combination with other plans and projects, with condition(s).

- In conclusion it is our opinion that consent for Projects (a), (b) and (c) can be granted but only subject to the implementation of the following condition:

"Prior to commencing transfer operations for the following projects (a), (b) and (c)

a. Liquid Cargoes (excluding substances consisting wholly or mainly of oil, and Liquid Gases)
b. Liquid Petroleum Gas
c. Liquid Cargoes (substances consisting wholly or mainly of oil)

Portland Harbour Authority will adhere to the conclusion of the navigational risk assessment and implement the range of measures set out in the standard operating procedure and put in place the General Directions proposed."

Figure 1 – Proposed Transfer Operation Locations

(using MAGIC and applying 2km buffer to the perimeter of relevant anchorages and berths)

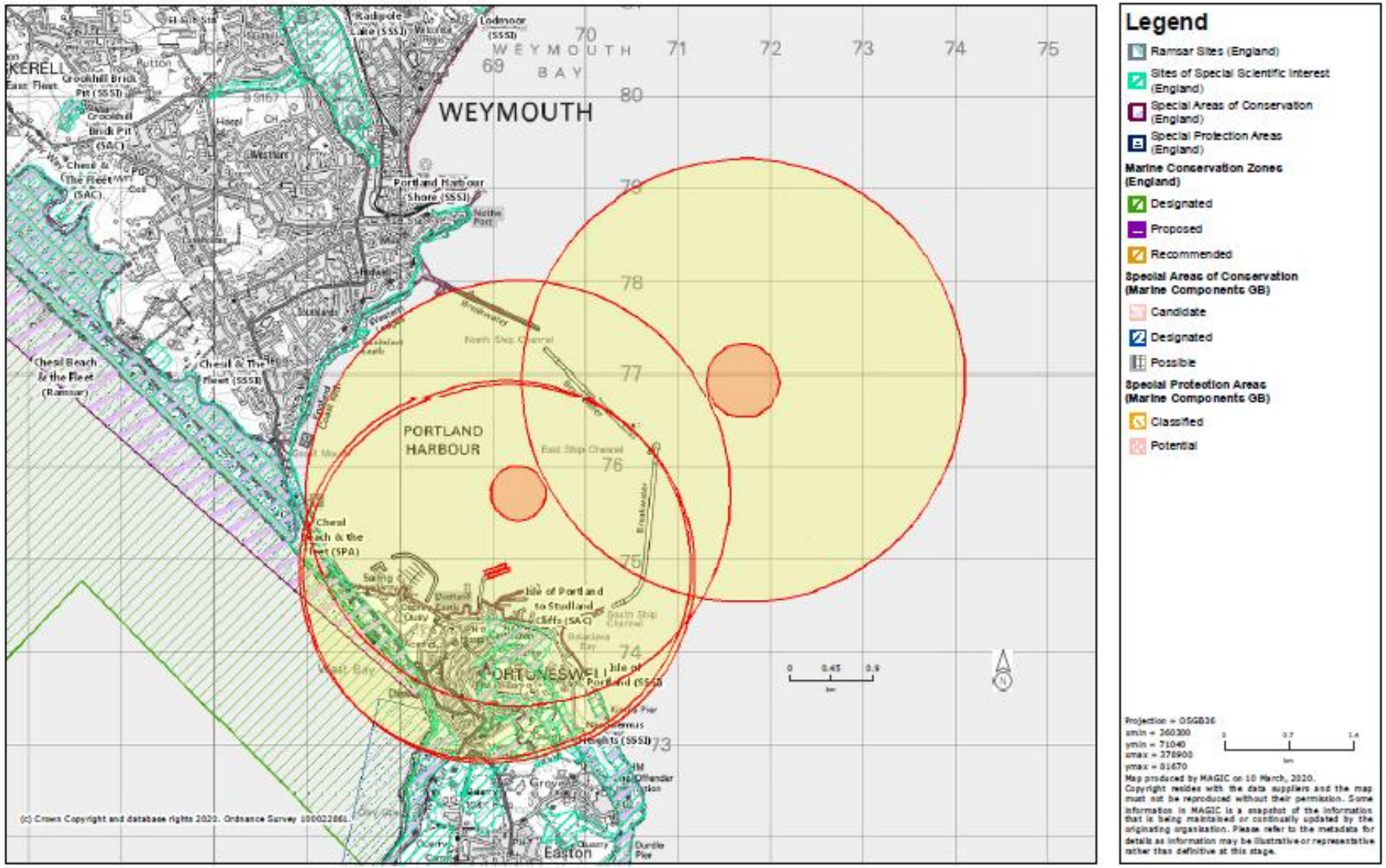
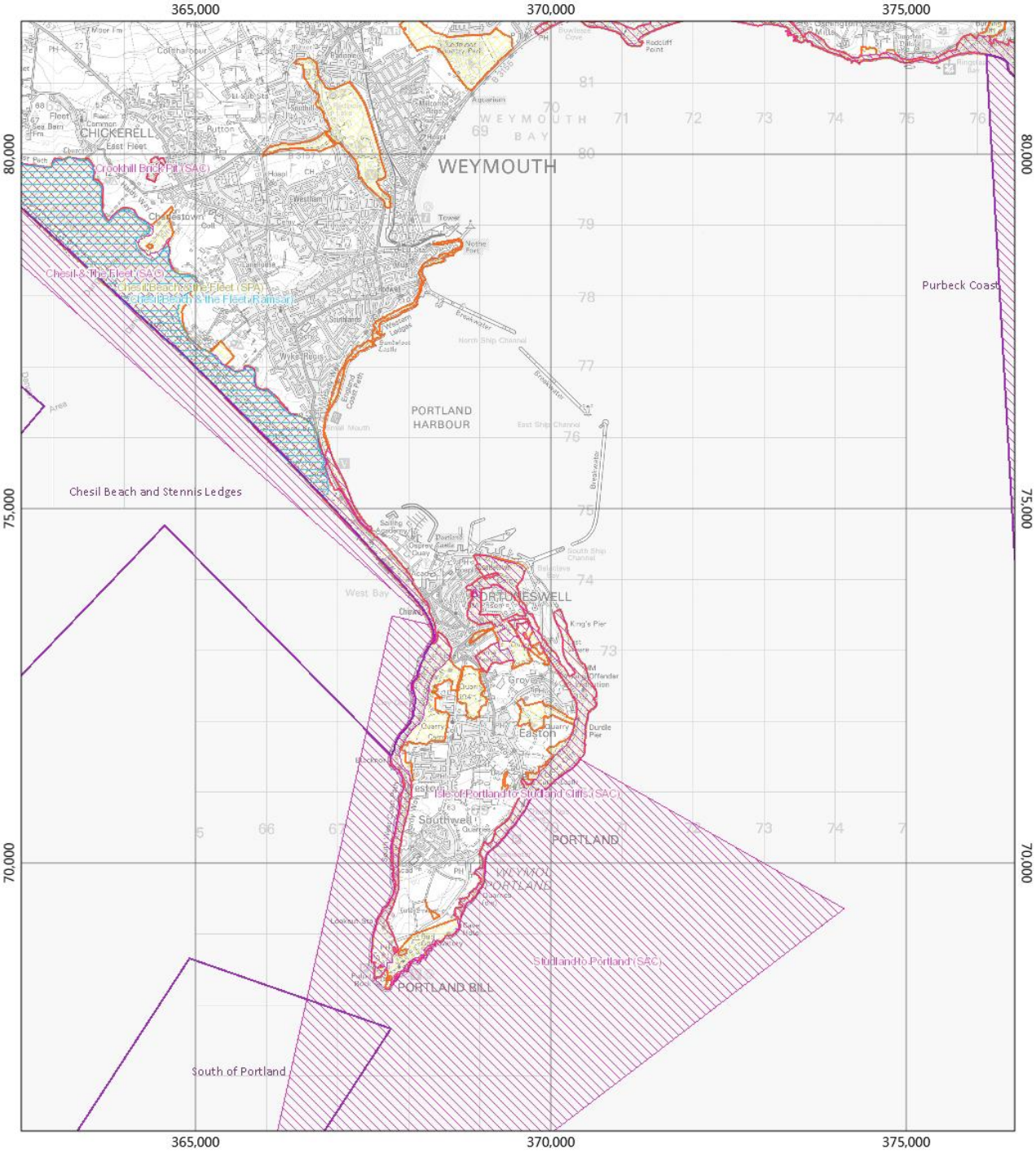


Figure 2 – Marine Protected Areas around Portland (Harbour)



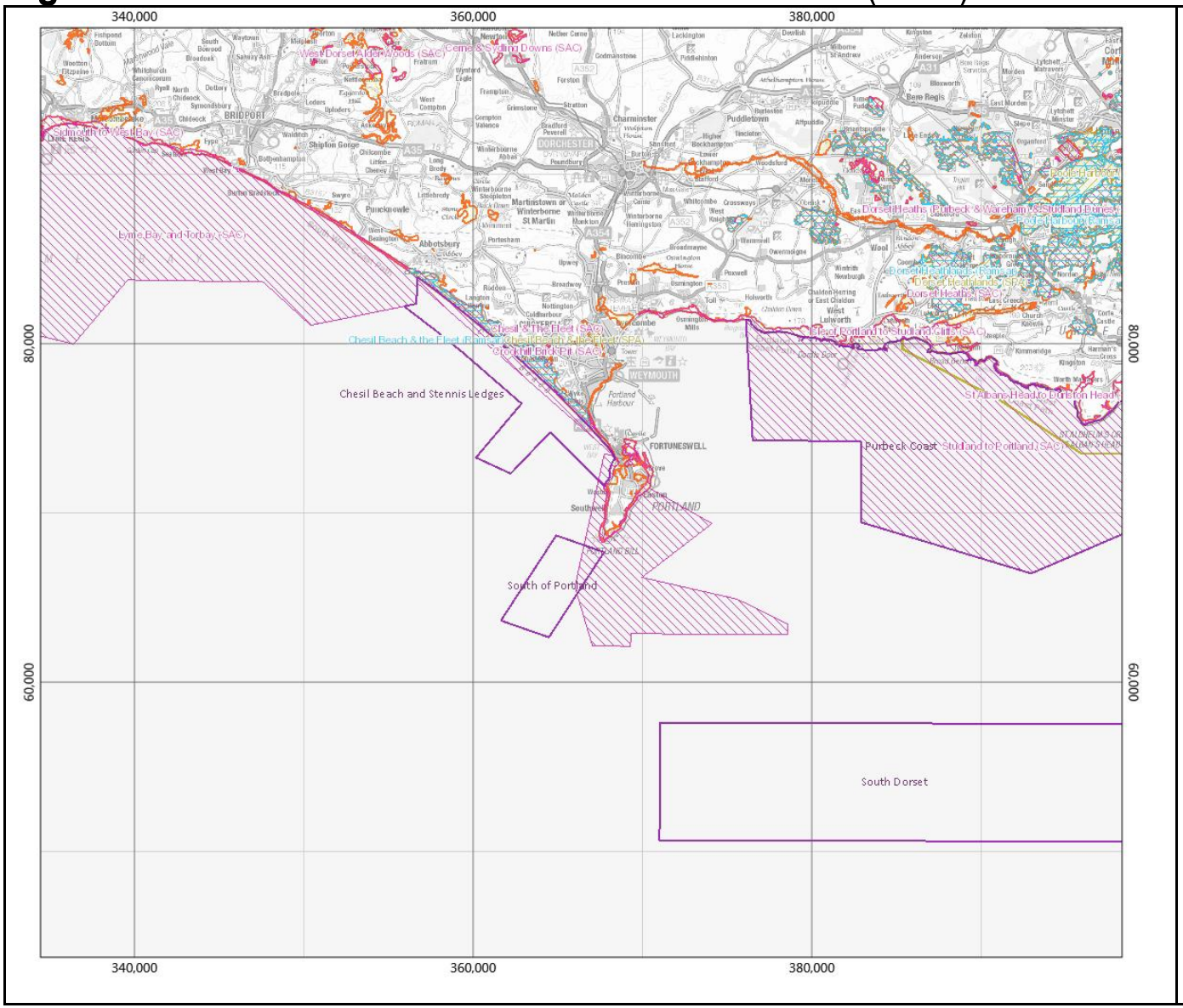
Key

- Marine Conservation Zones © Natural England, JNCC
- Ramsar sites England © Natural England
- Special Areas of Conservation England © Natural England
- Special Protection Areas England © Natural England
- Special Protection Areas England - Potential © Natural England
- SSSI England Simplified © Natural England
- Ordnance Survey (Greyscale) © Ordnance Survey

NATURAL ENGLAND

Map Produced from WebMap on 14/05/20
Map Projection: British National Grid
Map Scale at A3: 1:52,913

Figure 3 – Marine Protected Areas around Portland (Wide)



Key

- Marine Conservation Zones © Natural England, JNCC
- Ramsar sites England © Natural England
- Special Areas of Conservation England © Natural England
- Special Protection Areas England © Natural England
- Special Protection Areas England - Potential © Natural England
- SSSI England Simplified © Natural England

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Map Produced from WebMap on 14/05/20
Map Projection: British National Grid
Map Scale at A3: 1:211,653

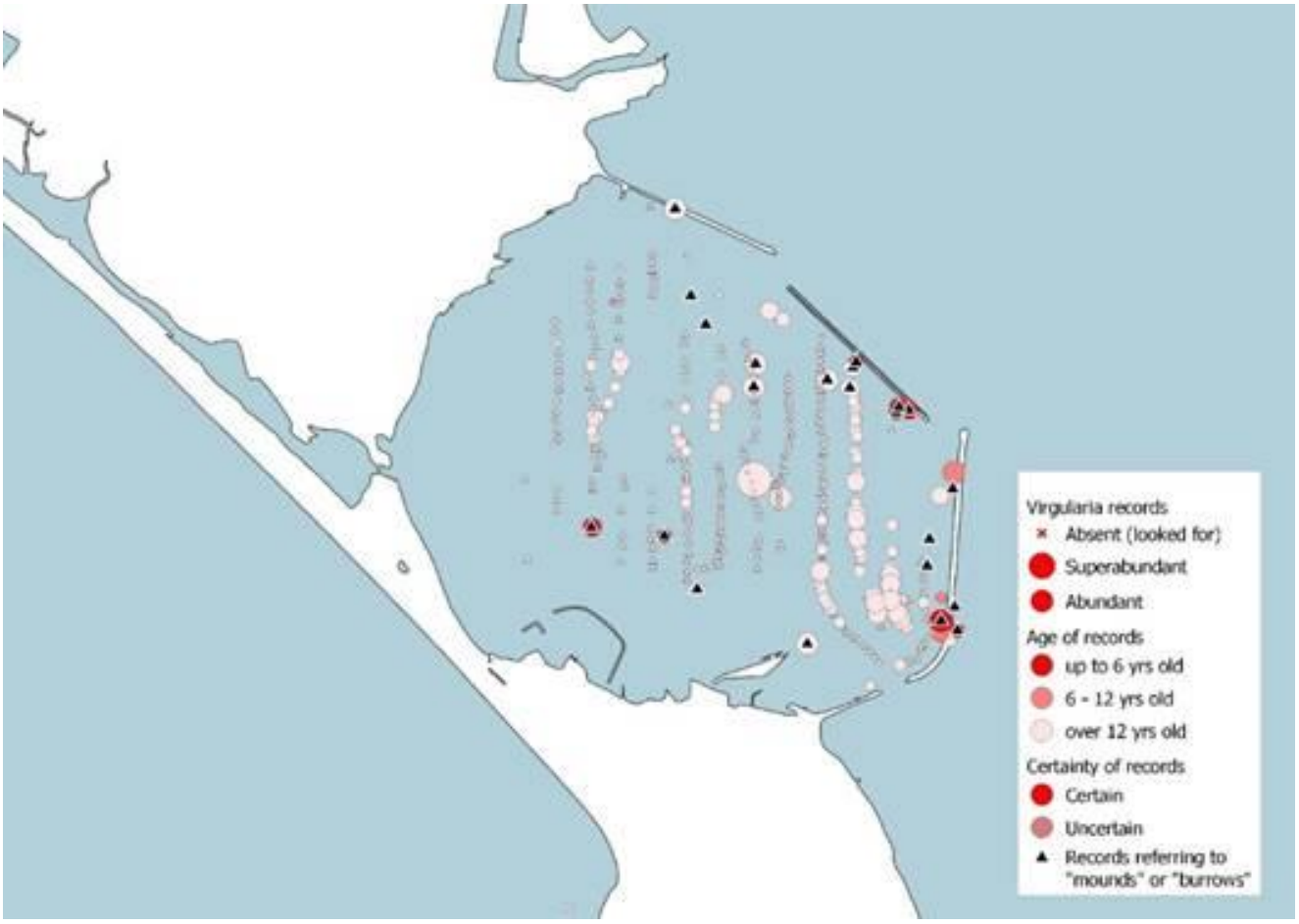
Appendix A
Data provided by Dorset Wildlife Trust (May 2019) relevant extracts

Email
From: Emma Rance <ERance@dorsetwildlifetrust.org.uk>
Sent: 30 April 2019 14:05

Dorset Wildlife Trust has written a Dorset Marine Audit to reflect the current understanding of the marine environment. This audit is not yet published but we understand it will be available through DERC.

Sea pens *Virgularia mirabilis*
As previously highlighted, the seabed of Portland Harbour contains an interesting deep mud habitat with *Virgularia mirabilis* sea pens and burrowing megafauna which is like this Habitat of Conservation Importance. This is also a rare example of this habitat in shallow water - it is usually found in depths greater than 12m. The audit data shows the two known biotopes containing sea-pen and burrowing megafauna communities are located in dense areas within Portland Harbour and are referred to in the following:

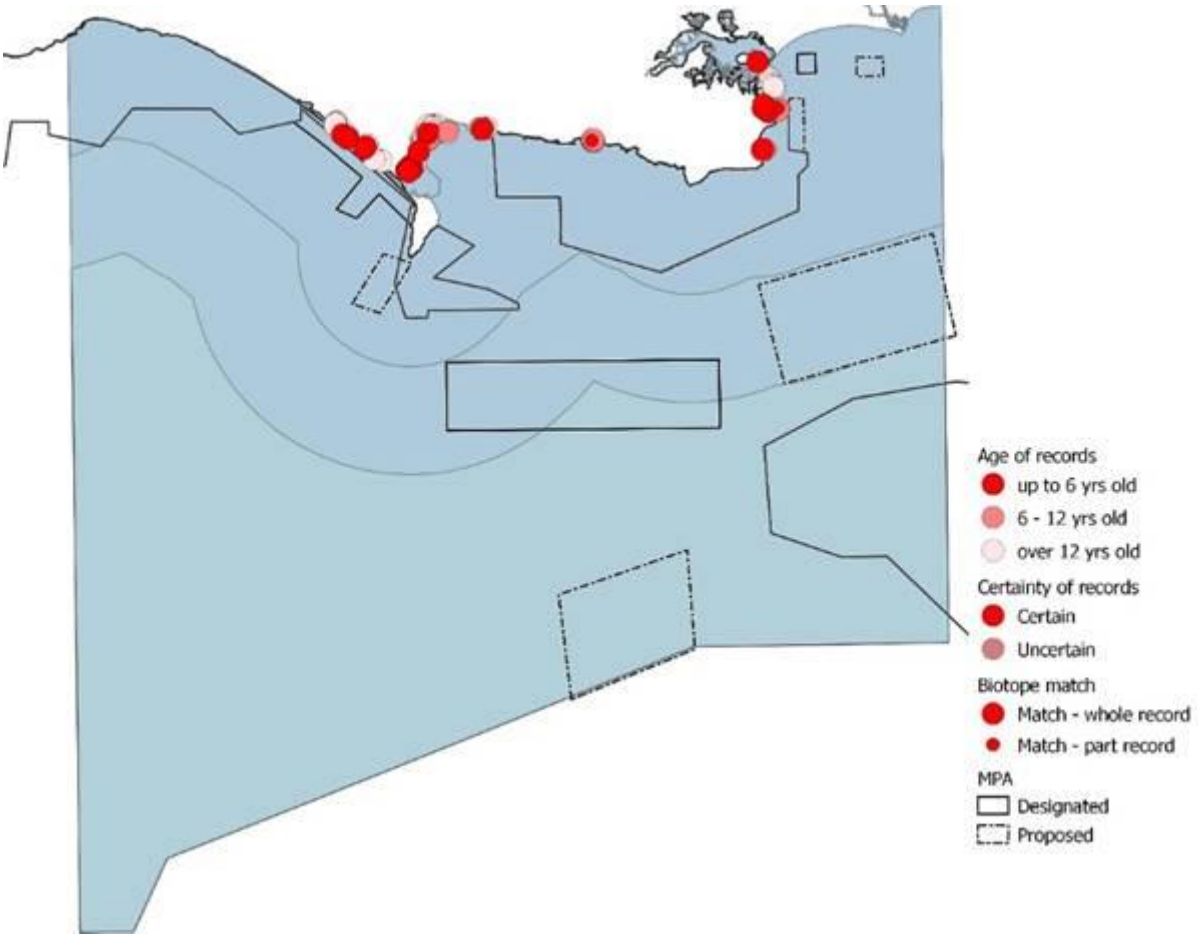
> There are a number of related biotopes describing communities of sea-pens and burrowing organisms in deep soft mud. Biotopes qualifying are generally understood to include "Seapens and burrowing megafauna in circalittoral fine mud" but not "*Philine aperta*[1] and *Virgularia mirabilis* in soft stable infralittoral mud". The latter better describes the mud habitat found in Portland Harbour (shallow water, abundant *Philine*) but the Portland Harbour mud habitat does also appear to be heavily bio-turbated, with many burrows and mounds. The burrows are variously attributed to *Cepola macropthalma* (red bandfish), *Nephrops*, and *Gobius niger*. On the grounds of the bioturbation and the rareness of this habitat in the south of the UK, it is proposed that the Portland Harbour seapen-dominated mud is considered a Habitat of Principal Importance.



State of knowledge: The Collins survey of Portland Harbour in 2000 documented the widespread occurrence of slender sea-pens in Portland Harbour. Further study to establish the degree of bio-turbation and the population of *Cepola* would be useful to support the proposal that this qualifies as a Habitat of Principal Importance

Seagrass beds Zoster sp.

The audit also highlights the two separate biotopes for seagrass beds *Zostera* sp. in Portland Harbour mapped by the Community Seagrass Initiative and shown below.



Appendix B

Mitigation/ Measures

1) Overview

Portland Harbour Authority compliance with the Port Marine Safety Code and it's Safety Management System has been discussed in Chapter 4. This chapter considers the measures that would be adopted in connection an oil transfer operation at Portland. These are considered under the following sub-headings:

- Risk Assessments
- Notices in Force
- Controlled Commercial Documents
- Operations Manual - Standard Operating Procedures
- Marine Pollution Plan
- Emergency Plan

2) Risk Assessments

This section relates to risk assessments. The Port Marine Safety Code requires that all harbour authorities base their powers, policies, plans and procedures on formal navigational risk assessment and that they maintain a Safety Management System (SMS) to control the risks that are identified.

The applicable Portland Harbour Authority Risk Assessments for STS operations is as follows:

Appendix No.	Marine Ref	Document Title
A11-2-1		Navigational Risk Assessment & Management of Service Providers

In summary, the Port has developed a navigational risk assessment specific to Ship to Ship Transfer Operations. This underpins the controls that have been identified for operations to take place such that risk can be considered "As Low As Reasonable Practical".

3) Notices in Force

This section includes a description of Portland Harbour Authority Notices in Force. These are typically Local Notice to Mariners, General Directions and Harbour Masters Directions and uploaded to https://www.portland-port.co.uk/local-notice-to-mariners-general-directions-and-harbour-masters-directions.

The applicable Portland Harbour Authority Notices in Force for STS operations are as follows:

Appendix No.	Marine Ref	Document Title
A11-3-1	GD2020 No.3	General Direction 2020 No 3 Transfer of Liquid Cargoes Consisting of Oil Between Vessels.
A11-3-2	GD2021 No X	COMPULSORY TOWAGE – SHIP TO SHIP TRANSFER OPERTIONS (STS) DRAFT
A11-3-3	No 18/2017	Ballast Water Management
A11-3-4	GD2016 No.1	General Direction No 1 of 2016 Portland Bunkering Operations. NOTE: In the case of debunkering the measures for bunkering would apply as the operation is the same but in reverse.

In summary a local regulation in the form of a General Direction has been developed for Ship to Ship Transfer of Oil and a second one relating to Towage and Ship to Ship Transfers. The existing Local Notice to Mariners relating to Ballast Water Management will continue to apply.

4) Controlled Commercial Documents

The following includes a description of Portland Harbour Authority controlled commercial documents. These are documents which are controlled and maintained up to date. These are used disseminate information to port users and Harbour Authority staff.

The applicable Portland Harbour Authority controlled commercial document for STS operations are as follows:

Appendix No.	Marine Ref	Document Title
A11-4-1	CC1	Pilotage Directions (V.10)
A11-4-2	CC49	Certificate of Approval to Operate within Portland Harbour as a Service Provider of Transfers Of Liquid Cargoes Between Vessels (Ship To Ship Transfer (STS) Operations)
A11-4-3	CC47	Transfer Operations Between Vessels Form 1 - Initial Transfer Application
A11-4-4	CC50	Form 2 - Declaration of Compliance from Person in Overall Advisory Control (POAC)
A11-4-5	CC51	Form 3 – Declaration of Compliance from Visiting Vessels
A11-4-6	CC46	Pre-Transfer Information Checklist For Use By Harbour Office
A11-4-7	CC48	Pre-STS Transfer Meeting Checklist For Use By Harbour Office
A11-4-8	CC24b	Emergency Contact Details For Vessels Calling For Ship To Ship Transfer
A-11-4-9	CC08	Marine Department Training Requirements

In summary, controlled commercial documents that apply to STS operations include certificate of approval to operate, Application Forms to undertake Transfer, Declarations of Compliance, Pre-Transfer checklists and meeting checklists, emergency contacts and training requirements.

5) Operations Manual - Standard Operating Procedures

The following includes a description of Portland Harbour Authority Operations Manual - Standard Operating Procedures. These are procedures that form part of the Safety Management System to ensure compliance with the Port Marine Safety Code.

The applicable Portland Harbour Authority Operations Manual - Standard Operating Procedures for STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-5-1	SOPHO21	Transfers of Liquid Cargoes Between Vessels
A11-5-2	SOPHO22	Ship to Ship Transfers
A11-5-3	SOPHC24	Harbour Office Local Port Services (LPS) During Ship To Ship Transfer Operations (STS)
A11-5-4	SOPHT23	STS Tug Operations DRAFT
A11-5-5	SOPHC17	Harbour Office Local Port Services
A11-5-6	SOPPG1	Pilotage -General Information
A11-5-7	SOPMC7	Pilot and Passenger Transfer Procedures
A11-5-8	SOPE2	Pollution Preparedness and Response **NOTE – this will replace the version included in Appendix 1E in the Oil Spill & Marine Pollution Contingency Plan 2020-2025**
A11-5-9	SOPE4	Pollution Reporting

In summary, standard operating procedures include ones that are specific to Ship to Ship Transfer Operations such as general measures, provision of local port services, tug operations, pilotage, pilot boats, pilots and transfer procedures and pollution response.

6) Marine Pollution Plan

The following includes a description of Portland Harbour Authority Marine Pollution Plan. This document sets out Portland Harbour Authority's Oil Spill & Marine Pollution Contingency Plan. The 'Plan' details the contingency arrangements for responding to actual or threatened marine pollution incidents within the Portland Harbour area. If an accidental oil spill was to take place then application of the OSCP would considerably reduce the environmental effects of a spill minimising the scale and extent of an oil spill.

The Portland Harbour Authority Marine Pollution Plan applies to all marine pollution risks in the port including STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-6-1	N/A	Portland Harbour Authority Marine Pollution and Oil Spill Contingency Plan. Version 30th June 2020 **NOTE – Appendix 1E of this document to be replaced with updated SOPE2 (see Appendix 11-5-8)**

Portland Harbour Authority has updated its Plan to take account of Ship to Ship Transfer Operations. Since updating the Plan it has also updated its Standard Operating Procedure for Marine Pollution which will replace the version that currently forms a supporting appendix to the Plan.

7) Emergency Plan

The following includes a description of Portland Harbour Authority Emergency Plan. This document outlines the procedures, roles and responsibilities required to respond to an emergency within the port other than for marine pollution.

The applicable Portland Harbour Authority Emergency Plan for STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-7-1	N/A	Portland Harbour Emergency Plan

In summary, this document will be an important document in support of STS operations but in reviewing the operation no specific changes are proposed.

8) Summary and Conclusion

Portland Harbour Authority compliance with the Port Marine Safety Code and it's Safety Management System has been discussed in Chapter 4. This chapter considers the measures that would be adopted in connection an oil ship to ship transfer operation at Portland. These are considered under a series of categories as follows:

- **Risk Assessments** – the Port has developed a navigational risk assessment specific to Ship to Ship Transfer Operations. This underpins the controls that are described in the sections that follow.
- **Notices in Force** - a local regulation in the form of a General Direction has been developed for Ship to Ship Transfer of Oil and a second one relating to Towage and Ship to Ship Transfers. The existing Local Notice to Mariners relating to Ballast Water Management will continue to apply as would the GD No 1 of 2016 would apply to bunkering and debunkering.
- **Controlled Commercial Documents –**Controlled commercial documents that apply to STS operations include certificate of approval to operate, Application Forms to undertake Transfer, Declarations of Compliance, Pre-Transfer checklists and meeting checklists, emergency contacts and training requirements.
- **Operations Manual - Standard Operating Procedures** - The standard operating procedures include ones that are specific to Ship to Ship Transfer Operations such as general measures, provision of local port services, tug operations, pilotage, pilot boats, pilots and transfer procedures and pollution response.
- **Marine Pollution Plan** - Portland Harbour Authority has updated its Plan to take account of Ship to Ship Transfer Operations. NOTE Appendix 1E of Portland Harbour Authority's Oil Spill & Marine Pollution Contingency Plan will be replaced with updated SOPE2 that forms part of the measures proposed for this operation.
- **Emergency Plan -** this document will be an important document in support of STS operations but in reviewing the operation no specific changes are proposed.

Table A – Information about designated sites and species

Site Name	Qualifying (Designated) Features Summary	Details about sites and species	Weblink to Natural England site details	Weblink to supplementary advice for Conservation Objectives	Marine and/ or Terrestrial	Relationship with Portland Harbour Authority Jurisdiction	Legally Underpinned By
Marine Conservation Zones							
Chesil Beach & Stennis Ledges MCZ	**EU Habitats Directive Annex I Habitats** High energy circalittoral rock High energy infralittoral rock High energy intertidal rock Intertidal coarse sediment Subtidal coarse sediment Subtidal mixed sediments Subtidal sand **Species listed in Annex II:** •Native oyster (Ostrea edulis) •Pink sea-fan (Eunicella verrucosa)	**Components include:** •Site information (feature and sub-feature descriptions, site overview, general information about the site and features) •Background information and geography •Site maps •Conservation Objectives •Supplementary advice on conservation objectives •Advice on operations **Additional information for consideration:** •Feature condition •Management measures •Further information	Chesil Beach & Stennis Ledges Conservation objectives	Chesil Beach and Stennis Ledges supplementary advice	Marine	Separated from Portland Harbour Inner and Outer Harbour by Isle of Portland	n/a
Sites of Special Scientific Interest (SSSIs)							
Chesil & The Fleet SSSI	See citation - https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1002654.pdf	**Units include -** •Unit 1 (littoral rock), •Unit 2 (littoral rock), •Unit 37 (inshore sublittoral sediment) and •Unit 38 (supralittoral rock)	Chesil & The Fleet details		Marine & Terrestrial	adjacent to Portland Outer Harbour with partial overlap at the intertidal zone	n/a
Portland Harbour Shore SSSI	See citation - https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1002791.pdf	**Units include -** **Portland Inner Harbour** North shore 'Western Ledges' •Unit 2 (littoral sediment), •Unit 3 (neutral grassland - lowland), •Unit 4 (earth heritage) and •Unit 13 (earth heritage) Hamm Beach • Unit 1 (supralittoral sediment) **Portland Outer Harbour** Newton's Cove' shoreline •Unit 11 (earth heritage) and •Unit 2 (littoral sediment)	Portland Harbour Shore details		Extends to low water therefore terrestral and marine	adjacent to Portland Outer Harbour with partial overlap at the intertidal zone	n/a

Site Name	Qualifying (Designated) Features Summary	Details about sites and species	Weblink to Natural England site details	Weblink to supplementary advice for Conservation Objectives	Marine and/ or Terrestrial	Relationship with Portland Harbour Authority Jurisdiction	Legally Underpinned By
Isle of Portland SSSI	See citation - https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1000128.pdf	**Units include:** • Unit 34 (broadleaved, mixed and yew woodland - lowland main habitat) • Unit 35 (supralittoral rock (coastal scrub on clay substrates on NE facing slopes))	Isle of Portland SSSI details		Above mean high water therefore considered terrestrial	adjacent to Portland Outer Harbour	n/a
South Dorset SSSI	See citation - https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1002501.pdf	**Units include -** •Unit 1 (supralittoral rock), •Unit 4 (supralittoral rock) and •Unit 7 (supralittoral)	South Dorset SSSI details		Extends to low water therefore terrestral and marine	near to Portland Outer Harbour	n/a
Protected Species							
Lagoon Sandworm, *Armandia Cirrhosa*	Schedule 5, Section 9 of the Wildlife and Countryside Act 1981 (as amended) and a Species of Principal Importance/ Priority Species	See weblink	Lagoon Sandworm details		Marine	Inner Harbour	n/a
Spiny seahorses *Hippocampus guttulatus*	Schedule 5, Section 9 of the Wildlife and Countryside Act 1981 (as amended) and a Species of Principal Importance/ Priority Species	See weblink	Hippocampus guttulatus details		Marine	Inner Harbour	n/a
Habitats of Principal Importance/ Priority Habitat							
Seagrass beds (Zostera spp.)	Habitats of Principal Importance/ Priority Habitat, and on the OSPAR list of threatened and/or declining habitats in need of protection	See weblink	Zostera details		Marine	Inner Harbour	n/a
Mud habitats in deep water (sea-pen and burrowing megafauna communities)	Habitats of Principal Importance/ Priority Habitat, and on the OSPAR list of threatened and/or declining habitats in need of protection	See weblink	Mud habitats in deep water details		Marine	Inner Harbour	n/a

Appendices Chapter 6. Water

Appendix 6.1 – Water Framework Directive Assessment

TRANSFER OF LIQUID CARGO BETWEEN VESSELS (OIL)

Portland Harbour Jurisdiction

Water Framework Directive Assessment

June 2021

CONTENTS

MAIN DOCUMENT

FIGURES

TABLES

1. Introduction

This document contains details of the Water Framework Directive Risk Assessment undertaken in connection with Transfer of Liquid Cargos between Vessels at anchorage or alongside berth (oil) in Portland Harbour Authority's Jurisdiction. It is prepared in support of an application being made by Portland Harbour Authority to the maritime & Coastguard Agency for an Oil Transfer Licence under The Merchant Shipping (Ship-to-Ship Transfers) Regulations 2020.

The key objectives of the water framework directive are:

- general protection of the aquatic ecology
- specific protection of unique and valuable habitats
- protection of drinking water resources
- and protection of bathing water.

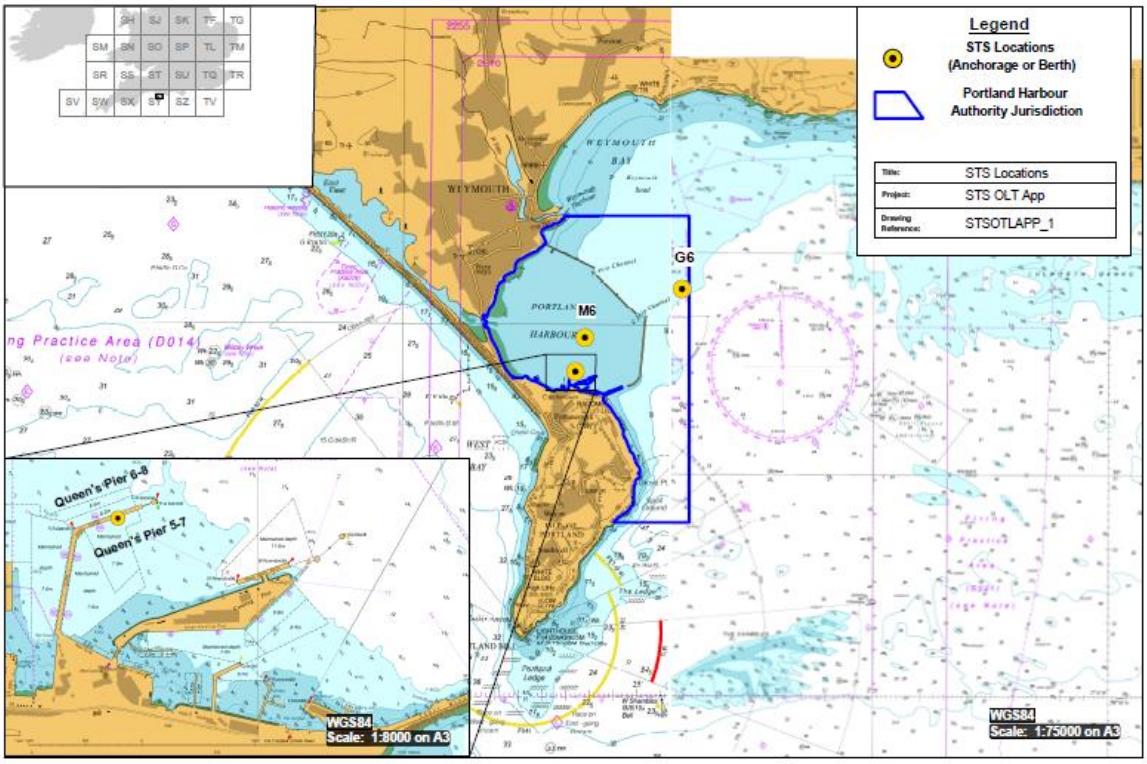
The assessment considers each of the project activities and associated impact on these receptors ultimately evaluating the implications of the project on the status of the relevant waterbodies. The Water Framework Directive Assessment is included as an appendix to this chapter.

1.1. Information and documentation about the project

An Environmental Statement has been prepared for the project. For details of the proposals see chapter 3 of the Environmental Statement and associated appendices. A Habitat Regulation Assessment (Appendix 5.1) also supports the application for an Oil Transfer Licence.

A location plan showing Portland Harbour Authority Jurisdiction, STS location and the wider area is included below:

Figure 1-1 Location Plan for Proposed STS Locations



1.2. Water Framework Directive Assessment

Environment Agency guidance for assessing proposals in estuarine and coastal waters was used for this assessment was found at https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters.

A WFD assessment can have up to 3 stages and it may not be necessary to complete all stages, depending on what is found at each stage. The stages are:

1. **screening -** excludes any activities that do not need to go through the scoping or impact assessment stages
2. **scoping -** identifies the receptors that are potentially at risk from your activity and need impact assessment
3. **impact assessment -** considers the potential impacts of your activity, identifies ways to avoid or minimise impacts, and shows if your activity may cause deterioration or jeopardise the water body achieving good status

In your WFD assessment you should consider:

- all activities you'll carry out
- each stage of the activity, for example construction, operation and decommissioning
- the water body your activity is in and all water bodies you could affect

Catchment data explorer should be used to find out which water body your activity is in and other linked water bodies it could affect.

1.3. The water body the activity is in, and adjacent water bodies

Applicable water bodies include:

Table 1-1 Waterbodies Assessed

Waterbody Name	Information Link
Portland harbour	https://environment.data.gov.uk/catchment-sa`planning/WaterBody/GB680805270000
Fleet Lagoon	https://environment.data.gov.uk/catchment-planning/WaterBody/GB510080077000
Weymouth Bay	https://environment.data.gov.uk/catchment-planning/WaterBody/GB680805070000
Dorset/ Hampshire	https://environment.data.gov.uk/catchment-planning/WaterBody/GB620705550000

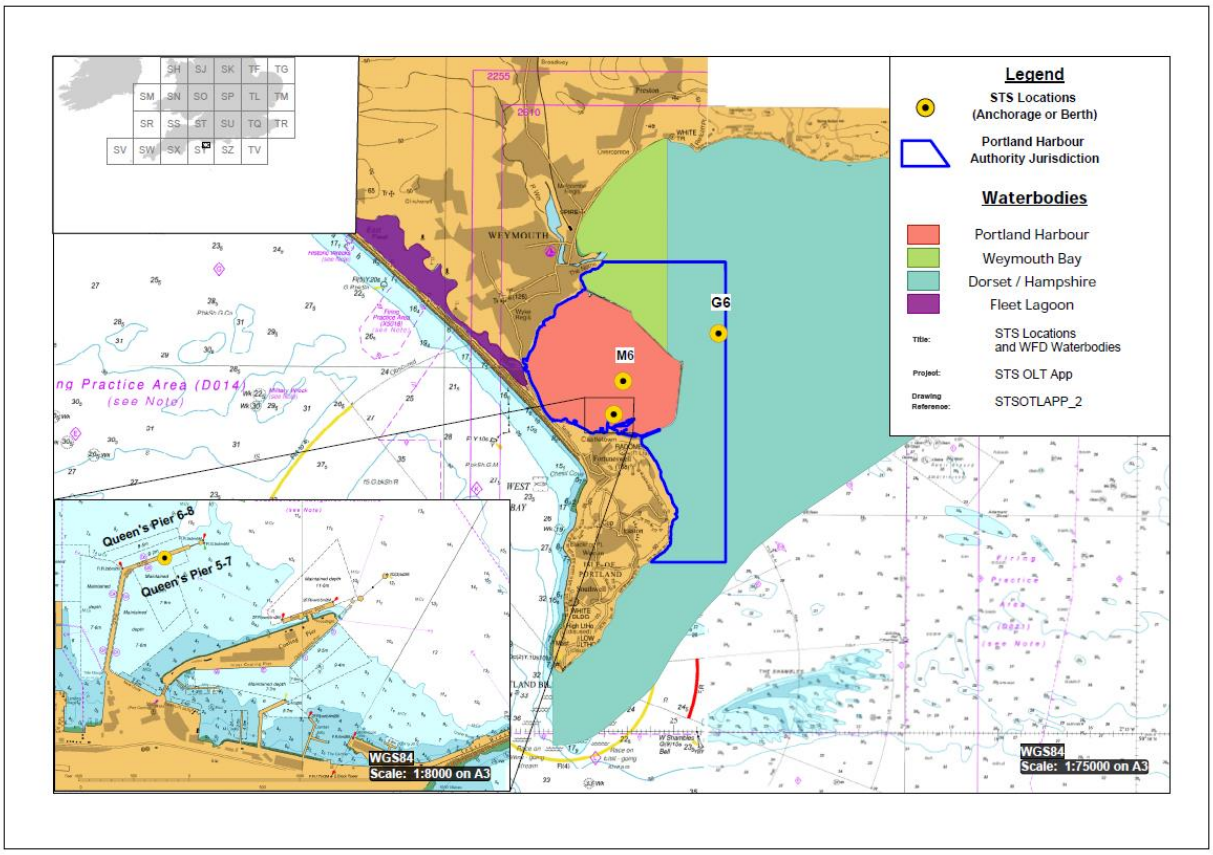
Details of transfer locations, applicable waterbody, adjacent waterbodies and other nearby waterbodies are as follows:

Table 1-2 STS locations and their relevant waterbodies

STS Location	Waterbody	Adjacent Waterbodies	Other nearby Waterbodies
Anchorage			
M6	Portland Harbour	Fleet Lagoon Weymouth Bay Dorset/ Hampshire	None
G6	Dorset/ Hampshire	Portland Harbour Weymouth Bay	Fleet Lagoon
Berths			
Queens Pier	Portland Harbour	Fleet Lagoon Weymouth Bay Dorset/ Hampshire	None

The applicable 4 waterbodies and STS locations are shown on Figure 1-2 below:

Figure 1-2 Location Plan for Proposed STS Locations in relation to applicable waterbodies



1.4. The water body the activity is in and adjacent water bodies – Detail

Table 1-3 Waterbody Detail

WFD water body name	Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
Water body ID	GB680805270000	GB680805070000	GB620705550000	GB510080077000
River basin district name	South West	South West	South West	South West
Water body type (estuarine or coastal)	Coastal	Coastal	Coastal	Estuarine
Water body total area (ha)	1024.43	790.40	51310.556	493.77
Overall water body status (2016)	Moderate	Moderate	Moderate	Moderate
Ecological status	Moderate	Moderate	Good	Moderate
Chemical status	Fail	Fail	Fail	Fail
Target water body status and deadline	Good by 2021	Good by 2021	Good by 2021	Moderate by 2015
Hydromorphology status of water body	Not Assessed	Not Assessed	Supports Good	Supports Good
Heavily modified water body and for what use	Yes: Coastal Protection; Navigation, Ports and Harbours	Yes: Coastal Protection; Navigation, Ports and Harbours	Not designated artificial or heavily modified	Not designated artificial or heavily modified
Higher sensitivity habitats present	Yes	Yes	Yes	Yes
Lower sensitivity habitats present	Yes	Yes	Yes	Yes
Phytoplankton status	High	Not Assessed	High	Good
History of harmful algae	Yes	Not Monitored	Not Monitored	Yes
WFD protected areas within 2km	Yes	Yes	Yes	Yes

[1] *Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters.*

Further details are available at **Appendix 1i, ii, iii, and iv**

2. STAGE 1 - Screening

2.1. Introduction

Screening excludes any activities that do not need to go through the scoping or impact assessment stages. Details of this assessment are included below.

2.2. Need for Scoping

You don't need to carry out scoping if your activity is low risk. Your activity is low risk if it's:

- a fast-track or accelerated marine licence activity that meets specific conditions
- maintaining pumps at pumping stations – if you do it regularly, avoid low dissolved oxygen levels during maintenance and minimise silt movement when restarting the pumps
- removing blockages or obstacles like litter or debris within 10m of an existing structure to maintain flow
- replacing or removing existing pipes, cables or services crossing over a water body – but not including any new structure or supports, or new bed or bank reinforcement
- 'over water' replacement or repairs to, for example bridge, pier and jetty surfaces – if you minimise bank or bed disturbance

Also, it you carried out your activity during 2009 to 2014 (when evidence was collected for the 2015 RBMPs) and you have a WFD assessment, don't repeat it unless:

- you've since changed how you carry out that activity, including method, size or scale, volume, depth, location or timings
- there's been a pollution incident since your activity was last carried out

2.3. Screening Assessment

The activity is transfer of liquid cargo between vessels (Oil) and it has been determined that it is not considered a low risk activity as defined above and furthermore the other criteria do not apply in this particular case. It is therefore necessary to go to the next stage and undertake Stage 2 scoping.

3. STAGE 2 - Scoping

3.1. Scoping: identify risks to receptors

At the scoping stage you must identify all your activity's potential risks to each receptor. The receptors are:

- hydromorphology
- biology – habitats
- biology – fish
- water quality
- protected areas

These receptors are based on the water body's quality elements.

There is also a requirement at the scoping stage to consider:

- invasive non-native species (INNS)

3.2. Receptors scoping assessment

The Environment Agency scoping template was used to assess potential risks to each of the receptors. The findings were recorded and are included at **Appendix 2a** together with the supporting analysis **Appendix 2b.**

A summary of the results are included in **Table 3-1.** below.

.

Table 3-1. Receptors Assessed during Scoping and outcome including Reason for Inclusion if applicable

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment			
		Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
S-1 Hydromorphology	YES – for Portland Harbour and Weymouth Bay	YES Impact assessment required • Waterbody heavily modified for same use as activity: Navigation, Ports and Harbours	NO Impact assessment not required • Waterbody not heavily modified	YES Impact assessment required • Waterbody heavily modified for same use as activity: Navigation, Ports and Harbours	NO Impact assessment not required • Waterbody not heavily modified
S-2 Biology: Habitats	YES	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats located in the vicinity of the transfer location (2.5 km from the central point of the anchorage) are taken forward to impact assessment	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment
S-2 Biology: Fish	NO	NO Impact assessment is not required • Site is not an estuary	NO Impact assessment is not required Site is not an estuary	NO Impact assessment is not required • Site is not an estuary	NO Impact assessment is not required • Although site is considered to be an estuary the activity is not taking place in the waterbody therefore this is not taken forward to impact assessment

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment			
		Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
S-3 Water quality	YES	YES Impact assessment required • Waterbody has a history of harmful algae • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.	YES Impact assessment required • History of harmful algae is not monitored however taken forward as precautionary measure. • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.	YES Impact assessment required • History of harmful algae is not monitored however taken forward as precautionary measure. • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as • precautionary measure.	YES Impact assessment required • Waterbody has a history of harmful algae • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment			
		Portland Harbour	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
S-4 Protected Areas	YES - see applicable water bodies	YES impact assessment required Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • Special Areas of Conservation • Shellfish Waters, and • Bathing Waters are taken forwards to impact assessment as a precautionary measure.	NO impact assessment not required No protected areas within this waterbody are located within 2.5 km from the central point of the anchorages or berths	YES impact assessment required Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • Special Areas of Conservation, and • Bathing Waters are taken forwards to impact assessment as a precautionary measure.	YES impact assessment required Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • Special Areas of Conservation • Special Protection Areas • Shellfish Waters • Nutrient Sensitive Areas are taken forwards to impact assessment as a precautionary measure.
S-5 Invasive non-native species	YES	YES Impact assessment required Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS	YES Impact assessment required Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS	YES Impact assessment required Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS	YES Impact assessment required Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS

4. STAGE 3 - Impact Assessment

4.1. Introduction

This document assesses the impact of proposed in-water cleaning of vessels on receptors identified during the scoping phase of the Water Framework Directive Risk Assessment.

4.2. Activities-Pressures

The activities are considered to be:

- Transport – Vessel Discharge/Emissions
- Transport – Vessel Movements

This mirrors the activities assessed in the Habitats Regulation Assessment.

For the purposes of the impact assessment the risks associated with the activities are considered to be:

- Movement and presence of vessels
- Accidental oil spill
- Discharge of ballast water during transfer process

These are the same risks used in the Environmental Assessment.

The liquid cargoes to be transferred are categorised as follows:

- Light Crude Oils
- Medium Crude Oils
- Heavy Crude Oils
- Light Oils
- Heavy Fuel Oils

The impact assessment for each receptor is considered below:

4.3. Impact Assessment for Receptors

The impact assessment for receptors included in the following sections:

- 4.3.1 hydromorphology
- 4.3.2 biology – habitats
- 4.3.3 biology – fish
- 4.3.4 water quality
- 4.3.5 protected areas

4.3.1. Hydromorphology

This section is organised as follows:

- Scoping Summary
- Impact Assessment Table
- Impact Assessment Discussion

4.3.1.1. Scoping Summary

The scoping summary is included below.

Table 4-1 Hydromorphology Scoping Summary

Waterbody	Requires impact assessment?	Scoping Summary
Portland Harbour	**YES**	YES Impact assessment required • Waterbody heavily modified for same use as activity: Navigation, Ports and Harbours
Dorset Hampshire	**NO**	NO Impact assessment not required • Waterbody not heavily modified
Weymouth Bay	**YES**	YES Impact assessment required • Waterbody heavily modified for same use as activity: Navigation, Ports and Harbours
Fleet Lagoon	**NO**	NO Impact assessment not required • Waterbody not heavily modified

4.3.1.2. Impact Assessment Overview

The impact assessment for Hydromorphology is included in Table 4-2 below. A more detailed overview and assessment of the possible impacts STS operations may have on the waterbodies' hydromophology can be found in Section 4.3.1.3 below:

Table 4-2 Overview of impacts on Hydromorphology for G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Location Specific Impact Assessment Without Mitigation/Measures	Measures
Portland Harbour	**YES**	• The proposed activity will not cause a significant impact on the hydromorphology of the waterbody – see explanation below.	• No Measures Required
Dorset Hampshire	**NO**	• Scoping concluded impact assessment not required.	• N/A
Weymouth Bay	**YES**	• The proposed activity will not cause a significant impact on the hydromorphology of the waterbody – see explanation below.	• No Measures Required
Fleet Lagoon	**NO**	• Scoping concluded impact assessment not required.	• N/A

4.3.1.3. Impact Assessment Discussion

For the purposes of the impact assessment the risks which may impact on hydromorphology are considered to be:

- Movement and presence of vessels

“Hydromorphology", as defined by the WFD, is the physical characteristics of the shape, boundaries, and content of a water body.

Sometimes the natural conditions of a water body are substantially altered, e.g. by navigation. The WFD recognises that in some cases the benefits of such uses need to be retained. If a series of criteria are fulfilled, it allows designation of the water body as “artificial” or “heavily modified”, e.g., ports and harbours.

Potential impacts associated with vessel movements on the hydromorphology can include increased sediment scouring, increased sediment suspension and changes to wave exposure.

The proposed activities already occur within the Portland Harbour and Dorset/ Hampshire waterbodies to a much greater extent than the proposed frequency and have done so for many years without impacting the hydromorphology of the waterbodies. Therefore, the impact on hydromorphology will not be impacted to any great extent and will not affect the water framework directives for the water body.

4.3.2. Biology – Habitats

This section is organised as follows:

- Scoping Summary
- Impact Assessment Table
- Impact Assessment Discussion

4.3.2.1. Scoping Summary

The scoping summary is included below.

Table 4-3 Biology- Habitats Scoping Summary

Waterbody	Requires impact assessment?	Scoping Summary
Portland Harbour	YES	Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment.
Dorset Hampshire	YES	Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats located in the vicinity of the transfer location (2.5 km from the central point of the anchorage) are taken forward to impact assessment
Weymouth Bay	YES	Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment
Fleet Lagoon	YES	Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment

4.3.2.2. Impact Assessment Overview

The impact assessment for Biology – Habitats is included in Table 4-4 below. A more detailed overview and assessment of the possible impacts STS operations may have on sensitive habitats can be found in Section 4.3.2.3 below:

Table 4-4 Overview of impacts on Biology – Habitats for G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland harbour	YES	• Possible impact on higher and lower sensitivity habitats in the unlikely event of an accidental oil spill. The impact from the movement	• See section 5
Dorset Hampshire	YES	• Possible impact on higher and lower sensitivity habitats in the unlikely event of an accidental oil spill	• See section 5
Weymouth Bay	YES	• Possible impact on higher and lower sensitivity habitats in the unlikely event of an accidental oil spill	• See section 5
Fleet Lagoon	YES	• Possible impact on higher and lower sensitivity habitats in the unlikely event of an accidental oil spill	• See section 5

4.3.2.3. Impact Assessment Discussion

For the purposes of the impact assessment the risks which may impact on **"Biology – Habitats"** are considered to be:

- Accidental oil spill
- Movement and presence of vessels
- Discharge of ballast water during transfer process

A range higher and lower sensitivity habitats are present within the waterbodies assessed, or in the case of the Dorset/ Hampshire Waterbodies within 2.5 km. These are detailed in Tables 4-5 and 4-6 below and shown in Appendix 2bii and 2biii. To complete these tables the EA water body summary table and Magic maps have been used to find information on the location and size of WFD habitats as recommended by the EA.

Table 4-5. Higher Sensitivity Habitats applicable to Water Framework Directive Assessment including detail of Prescence/ Absence in the Relevant Water Bodies

Higher sensitivity habitats	Portland Harbour	Dorset Hampshire	Weymouth Bay	Fleet Lagoon
chalk reef	-	✓	-	-
clam, cockle and oyster beds	-	-	-	-
intertidal seagrass	-	-	-	✓[1]
maerl	-	-	-	-
mussel beds, including blue and horse mussel	-	-	-	-
polychaete reef	-	-	-	-
saltmarsh	-	-	-	✓
subtidal kelp beds	✓	-	✓	-
subtidal seagrass	✓	-	✓	✓[1]

1. While Magic Map shows intertidal seagrass, the waterbody table lists subtidal seagrass. so both are recorded

Table 4-6. Lower Sensitivity Habitats applicable to Water Framework Directive Assessment including detail of Prescence/ Absence in the Relevant Water Bodies

Lower sensitivity habitats [3]	Portland Harbour	Dorset Hampshire	Weymouth Bay	Fleet Lagoon
cobbles, gravel and shingle	✓	✓	✓	-
intertidal soft sediments like sand and mud	✓	-	✓	✓
rocky shore	✓	-	-	-
subtidal boulder fields	-	-	-	-
subtidal rocky reef	✓	✓	✓	-
subtidal soft sediments like sand and mud	✓	✓	✓	-

The proposed activities already occur within the area and will not have any additional impact on habitats within the waterbodies, however in the unlikely event of an accidental oil spill, habitats could be affected in and may prevent the waterbodies from achieving their required objectives.

Sections in the Oil Spill and Marine Pollution Contingency Plan that relate to sensitive habitats which might be impacted in the event of a oil spill are as follows

- Section 3.4 Environmental, Commercial & Recreational Sensitivities;
- Section 2.6.5 Shoreline Matrix table identifies mud and sand shorelines as being the most sensitive when undertaking clean-up operations.
- and Appendix 3a which are the LRF Coastal Pollution Clearance Plan – Coastal Data Sheets which provide conservation overviews, clean-up strategies and sensitivity score assessments for the local sections of coastline. Sector 6, The Fleet Lagoon scores highest for sensitivity with maximum sensitivity for environmental considerations, with Sector 9 Portland Harbour and & Fleet Lagoon Entrance and Weymouth Bay and Harbour also scoring highly for sensitivity.

An oil spill can result in impact on both higher and lower sensitivity habitats through smothering habitats and contaminating sediments. Higher sensitivity habitats are at additional risk of impact and diverting any spilt oils from these areas in the event of an oil spill.

Further details on these measures are given in Section 5.

4.3.3. Biology – Fish

This section is organised as follows:

- Scoping Summary
- Impact Assessment Table
- Impact Assessment Discussion

4.3.3.1. Scoping Summary

The scoping summary is included below.

Table 4-7 Biology – Fish Scoping Summary

Waterbody	Requires impact assessment?	Scoping Summary
Portland Harbour	NO	Impact assessment is not required • Site is not an estuary
Dorset Hampshire	NO	Impact assessment is not required • Site is not an estuary
Weymouth Bay	NO	Impact assessment is not required • Site is not an estuary
Fleet Lagoon	NO	Impact assessment is not required • Although site is considered to be an estuary the activity is not taking place in the waterbody therefore this is not taken forward to impact assessment

4.3.3.2. Impact Assessment Overview

Scoping concluded that no impact assessment was required, thus no further discussion.

4.3.3.3. Impact Assessment Discussion

Scoping concluded that no impact assessment was required, thus no further discussion.

4.3.4. Water Quality

4.3.4.1. Scoping Summary

The scoping summary for water quality is included below.

Table 4-8 Water Quality Scoping Summary

Waterbody	Requires impact assessment?	Scoping Summary
Portland Harbour	YES	Impact assessment required • Waterbody has a history of harmful algae • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.

Waterbody	Requires impact assessment?	Scoping Summary
Dorset Hampshire	**YES**	Impact assessment required • History of harmful algae is not monitored however taken forward as precautionary measure. • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.
Weymouth Bay	**YES**	Impact assessment required • History of harmful algae is not monitored however taken forward as precautionary measure. • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.
Fleet Lagoon	**YES**	Impact assessment required • Waterbody has a history of harmful algae • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.

4.3.4.2. Impact Assessment Overview

Individual tables have been created for Impacts on Water Quality as follows:

- Table 4-9 Impacts on Water Quality from Harmful Algae
- Table 4-10 Impacts on Water Quality from chemicals on the EQSD list

The impact assessment for impacts on Water Quality from Harmful Algae are included in table 4-9 below. A more detailed overview and assessment of the possible impacts STS operations may have on Water Quality from Harmful Algae can be found in Section 4.3.4.3 below.

Table 4-9 Overview of impacts on Water Quality from Harmful Algae for G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland harbour	**YES**	• The proposed activity will not impact water quality due to harmful algae as there is no mechanism by which a bloom can be stimulated.	• No measures required
Dorset Hampshire	**YES**	• The proposed activity will not impact water quality due to harmful algae as there is no mechanism by which a bloom can be stimulated.	• No measures required
Weymouth Bay	**YES**	• The proposed activity will not impact water quality due to harmful algae as there is no mechanism by which a bloom can be stimulated.	• No measures required
Fleet Lagoon	**YES**	• The proposed activity will not impact water quality due to harmful algae as there is no mechanism by which a bloom can be stimulated	• No measures required

The impact assessment for impacts on Water Quality from chemicals on the EQSD list are included in table 4-0 below. A more detailed overview and assessment of the possible impacts STS operations may have on Water Quality from chemicals on the EQSD list can be found in Section 4.3.4.3 below.

Table 4-10 Overview of impacts on Water Quality from chemicals on the EQSD list for G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Location Specific Impact Assessment	Measures
Portland harbour	YES	• Possible impact on water quality due to possible release of chemicals on the EQSD list in the unlikely event of an accidental oil spill	• See section 5
Dorset Hampshire	YES	• Possible impact on water quality due to possible release of chemicals on the EQSD list in the unlikely event of an accidental oil spill	• See section 5
Weymouth Bay	YES	• Possible impact on water quality due to possible release of chemicals on the EQSD list in the unlikely event of an accidental oil spill	• See section 5
Fleet Lagoon	YES	Possible impact on water quality due to possible release of chemicals on the EQSD list in the unlikely event of an accidental oil spill	• See section 5

4.3.4.3. Impact Assessment Discussion

Harmful algae are consider first followed by impacts on Water Quality due to possible release of chemicals on the EQSD list

Water Quality impacts due to Harmful Algae

For the purposes of the impact assessment the risks which may impact on Water Quality due to Harmful Algae are considered to be:

- Movement and presence of vessels
- Discharge of ballast water during transfer process

Background

The status of the waterbodies were examined as part of the scoping stage of this Water Framework Directive Assessment for potential impacts on water bodies caused by the proposals.

The waterbody summary table indicates that the Portland Harbour and the Fleet Lagoon waterbodies have a history of harmful algae and therefore is considered in more detail below. While the Dorset/ Hampshire and Weymouth Bay waterbodies have not been monitored for harmful algae they have been brought forward for assessment as a precautionary measure due to their proximity to waterbodies with a history of harmful algae.

A history of harmful algae is important for assessment as some algae are known to encyst in the sediment. Subsequent sediment disturbance can cause resuspension of the cysts and trigger algal blooms and a degradation in water quality with implications for shellfish production areas. This behaviour is most well documented in *Alexandrium* spp. Other dinoflagellate species are also known to form cysts and many species of diatoms are known to have resting stages with vegetative cells having been recorded in sediments (*pers comms. Sara Carter, CEFAS, 22 August 2017)*

Site History

Samples of shellfish flesh from shellfish production areas have historically been examined for presence of toxins associated with Amnesic shellfish poisoning (ASP), Paralytic shellfish poisoning (PSP), and Lipophilic toxins (which includeds Diarrhetic shellfish poisoning (DSP)) by CEFAS on behalf of the Food Standards Agency (FSA). Additionally, water samples were examined for the presence of toxin producing species. The data was used for food safety purposes, allowing for the closure of shellfisheries if toxins in shellfish flesh exceeded regulatory limits.

The following shellfish production areas are within the waterbodies assessed.

- Portland Harbour Shellfish Waters East
- Portland Harbour Shellfish Waters West
- The Fleet Shellfish Waters

Monitoring data for The Fleet is available online from 2014 to present. Data prior to 2014 is no longer available online but previous WFD assessment conducted by PHAL for Portland Harbour provide a summary of exceedences going back to 2008. An overview of the waterbodies history of harmful algae, highlighting exceedances for the different biotoxin types and their causative agents are included in Table 4-11 below

Table 4-11. Overview of Waterbodies' History of Harmful Algae

Waterbody	Amnesic Shellfish Poisoning		Paralytic Shellfish Poisoning		Lipophilic toxins	
	Toxin Recorded in Flesh	Algal Cell Count exceeding Trigger Level	Toxin Recorded in Flesh	Algal Cell Count exceeding Trigger Level	Toxin Recorded in Flesh	Algal Cell Count exceeding Trigger Level
Portland Harbour	Yes	Yes	No	Yes	No	Yes
Dorset Hampshire*	*	*	*	*	*	*
Weymouth Bay*	*	*	*	*	*	*
Fleet Lagoon	No	Yes	No	Yes	No	Yes
*Note these waterbodies have no history of shellfish production so have not been monitored for harmful algae or biotoxins						

The data shows that the Portland Harbour production areas have only been closed once (May 2014). This was due to ASP toxins associated with *Pseudo-nitzschia* spp. *Pseudo-nitzschia* spp. cell numbers in exceedance regulatory action levels have been observed in samples taken during 2005, 2013 and 2014.

Alexandrium spp. cell numbers exceeded regulatory action levels in samples taken during 2006, 2007, 2009, 2010 and 2012 but PSP toxins (associated with *Alexandrium* spp.) were not recorded at levels that warranted the closure of the production areas.

The Fleet Lagoon production area data has no recorded closures due to harmful algae or biotoxins but high cell counts for *Prorocentrum lima* cells (associated with Lipophilic toxins) were recorded in 2014 and 2015; *Dinophysiaceae spp.* (also associated with Lipophilic toxins) in 2015; *Pseudo-nitzschia spp.* (associated with amnesic shellfish poisoning (ASP) in 2014, 2016 and 2018; and *Alexandrium Spp.* (associated with paralytic shellfish poisoning (PSP) in 2014 and 2016 -2020.

Conclusion

Activities in waterbodies have the potential to effect water quality through harmful algae in a number of ways. These include:

- Introduction of harmful algal species and strains, such as species which produce biotoxins or a prone to blooms.
- Sediment disturbance resuspending encysted algal spore which may promote an algal bloom
- Sediment disturbance releasing nutrients into the water column which may promote an algal bloom
- Introduction of nutrients in some other way to the water column which my promote an algal bloom

While there is evidence of *Pseudo-nitzschia* spp. associated with a biotoxin event, there is little evidence that resuspension of sediments containing *Pseudo-nitzschia* spp. can trigger algal blooms. *Alexandrium* species, while having been recorded has not been associated with a biotoxin event that has led to a closure of a fishery.

As a working harbour accommodating large vessels, with movements 24/7 365 days a year, there has been no suggestion of sediment resuspension associated with these activities triggering outbreaks thus it is reasonable to conclude that as the proposed activities are taking place in the existing anchorages they pose no additional risk over and above normal vessel movements. In the case of the proposed activity, the risk of an algal bloom resulting from suspension of sediment is considered negligible.

Water Quality impacts to possible release of chemicals on the EQSD list

For the purposes of the impact assessment the risks which may impact on Water Quality due to possible release of chemicals on the EQSD list are considered to be:

- Accidental oil spill

Background

Interrogation of the catchment data explorer revealed that the chemical classification in 2019 (the most recent classification) was "Fail" for all four waterbodies. The failure is due to failures in Priority Hazardous Substances, specifically Polybrominated diphenyl ethers (PBDEs) and Mercury and its compounds.

An enquiry was sent to the Environment Agency asking for the reason for the change. The response was received in an email on 25th January 2021 is included as **Appendix 3a.** The response states that

The change in classification has originated from a better understanding of their behaviour once released into the environment, as a result the environmental standard used by the environment agency has been significantly reduced.;

that

In essence it is likely that the levels of these substances in the locations you mention has changed little since the last classification in 2016

and that:

The change in status is most likely as a result of our method of classification and ability to more accurately monitor and report on the levels of those substances.

A further enquiry was sent to the Environment Agency asking for the sampling points for informing the decision for the waterbodies' chemical classification. The response is included in Appendix 3b and shows that no direct sampling has taken place within the waterbody and that

Potential Release of chemicals on the EQSD list as a result of STS operations

Transfer of Liquid Cargo between vessels at anchorage or alongside berths for the purpose of this assessment include the following:

- Light Crude Oils
- Medium Crude Oils
- Heavy Crude Oils
- Light Oils
- Heavy Fuel Oils

In the unlikely event of an accidental oil spill, chemicals listed on the EQSD lists may therefore be released and could affect water quality.

Further details on these measures are given in Section 5. Measures

4.3.5. Protected Areas

This section is organised as follows:

- Scoping Summary
- Impact Assessment Tables
- Impact Assessment Discussion

4.3.5.1. Scoping Summary

The scoping summary for Water Framework Directive Protected Areas is included below:

Table 4-12 Protected Areas Scoping Summary

Waterbody	Requires impact assessment?	Scoping Summary
Portland Harbour	YES	Impact assessment required Activity is the same as existing use so no additional impact to normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • **Special Areas of Conservation** • **Shellfish Waters, and** • **Bathing Waters** are taken forwards to impact assessment as a precautionary measure.
Dorset Hampshire	NO	Impact assessment not required No protected areas within this waterbody are located within 2.5 km from the central point of the anchorages or berths
Weymouth Bay	YES	Impact assessment required Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • **Special Areas of Conservation, and** • **Bathing Waters** are taken forwards to impact assessment as a precautionary measure.
Fleet Lagoon	YES	Impact assessment required Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • **Special Areas of Conservation** • **Special Protection Areas** • **Shellfish Waters, and** • **Nutrient Sensitive Areas** are taken forwards to impact assessment as a precautionary measure.

4.3.5.2. Impact Assessment Overview

Individual tables have been created for the different Water Framework Directive Protected Areas as follows:

- Table 4-13 Special Areas of Conservation (SACs)
- Table 4-14 Special Protection Areas (SPAs)
- Table 4-15 Shellfish Protected Areas
- Table 4-16 Bathing Waters
- Table 4-17 Nutrient Sensitive Areas

The impact assessment for Special Areas of Conservation is included in table 4-13 below. A more detailed overview and assessment of the possible impacts STS operations may have on these SACs can be found in Section 4.3.5.3 below and in the Habitats Regulation Assessment (Appendix 5-1 of the Environmental Statement)

Table 4-13 Overview of impacts on Special Areas of Conservation (SACs)

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland Harbour	YES	• Possible impact on Chesil and the Fleet SAC present in the waterbody in the unlikely event of an accidental oil spill	• See section 5
Dorset Hampshire	NO	• Scoping screened out requirement to assess any protected areas in this waterbody	• No Measures Required
Weymouth Bay	YES	• Possible impact on Isle of Portland to Studland Cliffs SAC present in the waterbody in the unlikely event of an accidental oil spill	• See section 5
Fleet Lagoon	YES	• Possible impact on Chesil and the Fleet SAC present in the waterbody in the unlikely event of an accidental oil spill	• See section 5

The impact assessment for Special Protection Areas is included in table 4-14 below. A more detailed overview and assessment of the possible impacts STS operations may have on these SPAs can be found in Section 4.3.5.3 below and in the Habitats Regulation Assessment (Appendix 5.1 of the Environmental Statement)

Table 4-14 Overview of impacts on Special Protection Areas (SPAs)

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland Harbour	NO	• Scoping screened out requirement as no SPA's in this waterbody	• No Measures Required
Dorset Hampshire	NO	• Scoping screened out requirement to assess any protected areas in this waterbody	• No Measures Required
Weymouth Bay	NO	• Scoping screened out requirement as no SPA's in this waterbody	• No Measures Required
Fleet Lagoon	YES	• Possible impact on Chesil Beach and the Fleet SPA protected areas present in the waterbody in the unlikely event of an accidental oil spill	• See section 5

The impact assessment for Shellfish Protected Areas are included in table 4-15 below. A more detailed overview and assessment of the possible impacts STS operations may have on these Shellfish Protected Areas can be found in Section 4.3.5.3 below.

Table 4-15 Overview of impacts on Shellfish Protected Areas for G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland Harbour	YES	• Possible impact on Portland Harbour East and Portland Harbour West Shellfish protected areas present in the waterbody in the unlikely event of an accidental oil spill.	• See section 5
Dorset Hampshire	NO	• Scoping screened out requirement to assess any protected areas in this waterbody	• No Measures Required
Weymouth Bay	NO	• No Shellfish protected areas are present within the waterbody therefore screened out of assessment	• No Measures Required
Fleet Lagoon	YES	• Possible impact on The Fleet Shellfish protected area present in the waterbody in the unlikely event of an accidental oil spill	• See section 5
1 Portland Harbour East is listed as within Weymouth Bay on the Catchment Data Explorer but interrogation of the MAGIC map data suggests this is an error.			

The impact assessment for Bathing Waters are included in table 4-16 below. A more detailed overview and assessment of the possible impacts STS operations may have on these Bathing Waters can be found in Section 4.3.5.3 below.

Table 4-16 Overview of impacts on Bathing Waters for G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland Harbour	YES	• Possible impact on Portland Harbour Castle Cove and Portland Harbour Sandsfoot Castle Bathing Waters present in the waterbody in the unlikely event of an accidental oil spill	• See section 5
Dorset Hampshire	NO	• Scoping screened out requirement to assess any protected areas in this waterbody	• No Measures Required
Weymouth Bay	YES	• Possible impact on Weymouth Lodmoor, Weymouth Central and Bowleaze Cove Bathing Waters present in the waterbody in the unlikely event of an accidental oil spill	• See section 5
Fleet Lagoon	NO	• No Bathing Waters present within the waterbody therefore screened out of impact assessment	• No Measures Required

The impact assessment for Nutrient Sensitive Areas are included in table 4-17 below. A more detailed overview and assessment of the possible impacts STS operations may have on these Nutrient Sensitive Areas can be found in Section 4.3.5.3 below.

Table 4-17 Overview of impacts on Nutrient Sensitive Areas

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Portland Harbour	NO	• Scoping screened out requirement to assess Nutrient Sensitive Areas and they are not present within the waterbody	• No Measures Required
Dorset Hampshire	NO	• Scoping screened out requirement to assess any protected areas in this waterbody	• No Measures Required

Waterbody	Requires impact assessment?	Impact Assessment	Measures
Weymouth Bay	NO	• Scoping screened out requirement to assess Nutrient Sensitive Areas and they are not present within the waterbody	• No Measures Required
Fleet Lagoon	YES	• The proposed activity will not impact the nutrient sensitive areas present within the waterbody (Coastal Streams to Fleet Lagoon NVZ S710 and Horsepool NVZ S691) as there is no risk of meaningful pathway by which the activity could affect the area.	• See section 5

4.3.5.3. Impact Assessment Discussion

Overview of Protected Areas

The proposed activities already occur within the area and will not have any additional impact on protected areas within the waterbodies, however in the unlikely event of an accidental oil spill, Protected areas could be affected and may prevent the waterbodies from achieving their stated objectives. For this reason, all protected areas within the waterbodies assessed apart from Dorset/ Hampshire were carried through to impact assessment. In the case of the Dorset/ Hampshire waterbody due to its large size, only protected areas within 2.5 km of the transfer locations were considered.

The protected areas assessed are listed in table 4-18 below and shown in appendix 2biv.

Table 4-18 List of Waterbodies and Protected areas present by type

Waterbody	Special Areas of Conservation (SAC)	Special Protection Areas (SPA)	Shellfish Waters	Bathing Waters	Nutrient Sensitive Areas
Portland harbour	• Chesil and The Fleet EMS	• None	• Portland Harbour East • Portland Harbour West	• Portland Harbour Castle Cove • Portland Harbour Sandsfoot Castle	• None
Dorset Hampshire	• None	• None	• None	• None	• None
Weymouth Bay	• Isle of Portland to Studland Cliffs	• None	• None	• Weymouth Lodmoor • Weymouth Central • Bowleaze Cove	• None
Fleet Lagoon	• Chesil and The Fleet EMS	• Chesil Beach & The Fleet EMS	• The Fleet	• None	• Coastal Streams to Fleet Lagoon NVZ S710 • Horsepool NVZ S691

Special Areas of Conservation

For the purposes of the impact assessment the risks which may impact on Special Areas of Conservation are considered to be:

- **Accidental oil spill**
- **Discharge of ballast water during transfer process**

The Chesil and the Fleet Special Area of Conservation intersects both the Fleet and Portland Harbour waterbodies and is protected for its coastal lagoon features.

A small portion of the Isle of Portland to Studland Cliffs Special Area of Conservation lies within the Weymouth Bay Waterbody, extending to Mean Low Water. This SAC is designated for its Vegetated Sea Cliffs and Semi-Natural dry grasslands.

A more detailed overview and assessment of the possible impacts STS operations may have on these SACs can be found in the Habitats Regulation Assessment (Appendix 5-1 of the Environmental Statement)

The activities "Transport – Vessel Discharge/Emissions" and "Transport – Vessel Movements" already occur in the location assessed and are not considered to impact on within the waterbodies, however in the unlikely event of an accidental oil spill, the features of the SAC could be affected. Mechanisms include introduction of contaminants to sediments and the water column affecting the species and features for which the SAC is designated

Further details on these measures are given in Section 5. Measures

Special Protection Areas

For the purposes of the impact assessment the risks which may impact on Special Protection Areas are considered to be:

- Accidental oil spill
- Discharge of ballast water during transfer process

Chesil Beach & the Fleet special protection area intersects both the Fleet Lagoon waterbody and is protected for its breeding population of Little Tern (*Sternula albifrons*) and non-breeding population of Widgeon (*Mareca penelope*).

A more detailed overview and assessment of the possible impacts STS operations may have on the SPA can be found in the Habitats Regulation Assessment (Appendix 5-1 of the Environmental Statement)

The activities "Transport – Vessel Discharge/Emissions" and "Transport – Vessel Movements" already occur in the location assessed and are not considered to impact on Special Protection Areas within the waterbodies, however in the unlikely event of an accidental oil spill, the species for which the SPA is designated could be affected. Mechanisms include introduction of contaminants to sediments and the water column affecting the species and habitats on which they rely.

Further details on these measures are given in Section 5. Measures

Shellfish Waters

For the purposes of the impact assessment the risks which may impact on Shellfish Waters are considered to be:

- Accidental oil spill
- Discharge of ballast water during transfer process

The relevant Shellfish Protected Areas are given in table 4-19 below, along with their food safety classification and species of production.

Table 4-19. Shellfish Protected areas and details for their designation.

Shellfish Protected Area Name	Food Safety classification	Species cultivated
Portland Harbour East	Not Currently Classified	No Commercial Cultivation[1]
Portland Harbour West	Not Currently Classified	None
The Fleet	Long Term B	Pacific Oyster (*Magallana gigas)*

1 The following species are cultivated at a study site and not sold for human consumption:

- Mytilus edulis (Blue Mussel)
- Pectens maximus (King Scallop)
- Ostrea edulis (Native Oyster)
- Crassostrea gigas (Pacific Oysters)

The shellfish waters are described in the Shellfish Action Plan (version last updated in 2015) as follows:

"The Portland Harbour is located on the South Dorset coast, in Southwest England and covers an area of approximately 10km². The harbour is located between the towns of Weymouth to the north and Portland to the south and contains two designated shellfish waters: Portland Harbour West and Portland Harbour East. A causeway runs to the west of the shellfish waters linking the two towns. The shellfish waters are partially enclosed by a breakwater which provides effective shelter from wave exposure, whilst still allowing free water movement to and from coastal waters. The mouth of the River Wey is 1.7km from the northern entrance to Portland Harbour.

The harbour is very popular with water sports enthusiasts and supports a commercial port based at Castletown, on the northern tip of Portland. Depths within the shellfish waters reach 10 metres and the seabed consists mainly of mobile sands.

Species present: Portland Harbour is currently classified for the harvest of Pacific oysters (Crassostrea gigas), mussels (Mytilus edulis) and Portland clams (Tapes decussatus). All species are harvested by hand."

It also sets out that:

"As a result of the work undertaken during the first set of plans and our assessment of the current quality of Portland West and East shellfish waters we are proposing a package of actions aimed at maintaining the water quality so that shellfish standards continue to be met in future."

The CEFAS data hub was also consulted for details about the classification of these waters (https://www.cefas.co.uk/cefas-data-hub/food-safety/). Shellfish production areas are classified according to the extent to which shellfish sampled from the area are contaminated with *E. coli*. The classification of a production area determines the treatment required before the molluscs may be marketed. This revealed that these Portland harbour East and West are not currently classified and therefore not in production.

A multitrophic aquaculture site culturing a variety of molluscan shellfish is located off the north-eastern breakwater. As this is a research site and not for commercial production, the site is not currently classified for shellfish production.

The Fleet is classified for the production of Pacific Oysters (*Magallana gigas*) and is classified as long-term B. Due to the lack of testing during the Covid-19 pandemic the fishery has been temporarily closed

The activities "Transport – Vessel Discharge/Emissions" and "Transport – Vessel Movements" already occur in the location assessed and are not considered to impact on Shellfish Protected Areas within the waterbodies, however in the unlikely event of an accidental oil spill, the species cultivated and businesses harvesting them could be affected. Mechanisms include contaminants being taken into shellfish effecting their harvestability or marketability.

Further details on these measures are given in Section 5. Measures

Bathing Waters

For the purposes of the impact assessment the risks which may impact on Bathing Water are considered to be:

- Accidental oil spill

The Portland Harbour and Weymouth Bay waterbodies both contain several designated bathing waters. The Dorset/Hampshire waterbody contains designated bathing waters, but none are located within 2.5 km of the transfer locations so have not been assessed.

Bathing waters are monitored for *Escherichia coli* and intestinal enterococci in the water, throughout the bathing season (15 May to 30 September). The readings taken over the last four bathing seasons then determine the annual classification for that water. The classifications are:

- Excellent – the highest, cleanest class
- Good – generally good water quality
- Sufficient – the water quality meets the minimum standard
- Poor – the water quality has not met the minimum standard

The waterbodies assessed and their classification from 2019 are given in table 4-20 below

Table 4-20. Bathing Waters and their 2019 classification

Bathing Waters	2019 Classification
Portland Harbour Castle Cove	Excellent
Portland Harbour Sandsfoot Castle	Good
Weymouth Lodmoor	Excellent
Weymouth Central	Excellent
Bowleaze Cove	Excellent

The activities "Transport – Vessel Discharge/Emissions" and "Transport – Vessel Movements" already occur in the location assessed and are not considered to impact on Bathing Waters, however in the unlikely event of an accidental oil spill, Bathing Waters could be required to temporarily closed.

Further details on these measures are given in Section 5. Measures

Nutrient Sensitive Areas

For the purposes of the impact assessment the identified risks are considered to impact on Nutrient Sensitive Areas

The Fleet Lagoon waterbodies contains two Nutrient Sensitive Areas. The most recent designation datasheets for these areas from 2017 were used to inform table 4-21 below which lists the areas along with their reason for designation and the main pollution source.

Table 4-21. Nutrient Sensitive Areas and their 2017 classification

Nutrient Sensitive Areas	Reason for Designation	Pollution Source
Coastal Streams to Fleet Lagoon NVZ S710	Vulnerable to Nitrate Pollution	Agricultural
Horsepool NVZ S691	Vulnerable to Nitrate Pollution	Agricultural

The activities "Transport – Vessel Discharge/Emissions" and "Transport – Vessel Movements" already occur in the location assessed and are not considered to impact on the Nutrient Sensitive Areas, nor will there be any meaningful pathway by which nitrates might be released. It is therefore considered that the activity will have no impact on the Nutrient Sensitive Areas.

4.3.6. Invasive non-native species

This section is organised as follows:

- Scoping Summary
- Impact Assessment Table
- Impact Assessment Discussion

4.3.6.1. Scoping Summary

The scoping summary is included below.

Table 4-22 Invasive Non-Native Species Scoping Summary

Waterbody	Requires impact assessment?	Scoping Summary
Portland Harbour	YES	Impact assessment required • Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS
Dorset Hampshire	YES	Impact assessment required • Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS
Weymouth Bay	YES	Impact assessment required • Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS
Fleet Lagoon	YES	Impact assessment required • Activity may involve discharge of ballast water during transfer process which could result in the potential introduction or spread of INNS

4.3.6.2. Impact Assessment Overview

The impact assessment for Hydromorphology is included in Table 4-23 below. A more detailed overview and assessment of the possible impacts STS operations may have on the waterbodies' hydromophology can be found in Section 4.3.6.3 below:

Table 4-23 Overview of impacts from Invasive Non-Native Species G6, M6 and Queen's Pier

Waterbody	Requires impact assessment?	Location Specific Impact Assessment	Measures
Portland harbour	YES	• Activity poses a risk for the introduction or spread of INNS due to the release of ballast water	○ See section 5
Dorset Hampshire	YES	• Activity poses a risk for the introduction or spread of INNS due to the release of ballast water	○ See section 5
Weymouth Bay	YES	• Activity poses a risk for the introduction or spread of INNS due to the release of ballast water	○ See section 5
Fleet Lagoon	YES	• Activity poses a risk for the introduction or spread of INNS due to the release of ballast water	○ See section 5

4.3.6.3. Impact Assessment Discussion

While the activities "Transport – Vessel Discharge/Emissions" and "Transport – Vessel Movements" already occur in the location assessed there is and risk of introduction of Invasive Non-native Species due to ballast water release during transfer operations. This does not typically occur currently so poses an additional risk.

Further detail on this measure is given in Section 5. Measures

4.4. Cumulative Assessment

In considering cumulative assessment and incombination effects vessels anchoring in Weymouth Bay due to the Covid 19 pandemic are taken into account.

Portland Harbour Authority has reviewed its management system and considers that the existing measures in place continue to apply and that there are no additional measures required for STS over and above what has been introduced as part of the wider assessment of risk and associated requirements.

5. Measures

5.1. Overview

Portland Harbour Authority compliance with the Port Marine Safety Code and it's Safety Management System has been discussed in Chapter 4. This chapter considers the measures that would be adopted in connection an oil transfer operation at Portland. These are considered under the following sub-headings:

- Risk Assessments
- Notices in Force
- Controlled Commercial Documents
- Operations Manual - Standard Operating Procedures
- Marine Pollution Plan

Emergency Plan

A guide specifically relating to STS has also been developed as follows with further information

- STS Guide to Transfer Operation

5.2. Risk Assessments

This section relates to risk assessments. The Port Marine Safety Code requires that all harbour authorities base their powers, policies, plans and procedures on formal navigational risk assessment and that they maintain a Safety Management System (SMS) to control the risks that are identified.

The applicable Portland Harbour Authority Risk Assessments for STS operations is as follows:

Appendix No.	Marine Ref	Document Title
A11-2-1		Navigational Risk Assessment & Management of Service Providers

In summary, the Port has developed a navigational risk assessment specific to Ship to Ship Transfer Operations. This underpins the controls that have been identified for operations to take place such that risk can be considered "As Low As Reasonable Practical".

5.3. Notices in Force

This section includes a description of Portland Harbour Authority Notices in Force. These are typically Local Notice to Mariners, General Directions and Harbour Masters Directions and uploaded to https://www.portland-port.co.uk/local-notice-to-mariners-general-directions-and-harbour-masters-directions.

The applicable Portland Harbour Authority Notices in Force for STS operations are as follows:

Appendix No.	Marine Ref	Document Title
A11-3-1	GD2020 No.3	General Direction 2020 No 3 Transfer of Liquid Cargoes Consisting of Oil Between Vessels.
A11-3-2	GD2021 No X	COMPULSORY TOWAGE – SHIP TO SHIP TRANSFER OPERTIONS (STS) DRAFT
A11-3-3	No 18/2017	Ballast Water Management

A11-3-4	GD2016 No.1	General Direction No 1 of 2016 Portland Bunkering Operations. **NOTE: In the case of debunkering the measures for bunkering would apply as the operation is the same but in reverse.**

In summary a local regulation in the form of a General Direction has been developed for Ship to Ship Transfer of Oil and a second one relating to Towage and Ship to Ship Transfers. The existing Local Notice to Mariners relating to Ballast Water Management will continue to apply as would the GD No 1 of 2016 would apply to bunkering and debunkering.

5.4. Controlled Commercial Documents

The following includes a description of Portland Harbour Authority controlled commercial documents. These are documents which are controlled and maintained up to date. These are used disseminate information to port users and Harbour Authority staff.

The applicable Portland Harbour Authority controlled commercial document for STS operations are as follows:

Appendix No.	Marine Ref	Document Title
A11-4-1	CC1	Pilotage Directions (V.10)
A11-4-2	CC49	Certificate of Approval to Operate within Portland Harbour as a Service Provider of Transfers Of Liquid Cargoes Between Vessels (Ship To Ship Transfer (STS) Operations)
A11-4-3	CC47	Transfer Operations Between Vessels Form 1 - Initial Transfer Application
A11-4-4	CC50	Form 2 - Declaration of Compliance from Person in Overall Advisory Control (POAC)
A11-4-5	CC51	Form 3 – Declaration of Compliance from Visiting Vessels
A11-4-6	CC46	Pre-Transfer Information Checklist For Use By Harbour Office
A11-4-7	CC48	Pre-STS Transfer Meeting Checklist For Use By Harbour Office
A11-4-8	CC24b	Emergency Contact Details For Vessels Calling For Ship To Ship Transfer
A-11-4-9	CC08	Marine Department Training Requirements

In summary, controlled commercial documents that apply to STS operations include certificate of approval to operate, Application Forms to undertake Transfer, Declarations of Compliance, Pre-Transfer checklists and meeting checklists, emergency contacts and training requirements.

5.5. Operations Manual - Standard Operating Procedures

The following includes a description of Portland Harbour Authority Operations Manual - Standard Operating Procedures. These are procedures that form part of the Safety Management System to ensure compliance with the Port Marine Safety Code.

The applicable Portland Harbour Authority Operations Manual - Standard Operating Procedures for STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-5-1	SOPHO21	Transfers of Liquid Cargoes Between Vessels
A11-5-2	SOPHO22	Ship to Ship Transfers
A11-5-3	SOPHC24	Harbour Office Local Port Services (LPS) During Ship To Ship Transfer Operations (STS)
A11-5-4	SOPHT23	STS Tug Operations DRAFT
A11-5-5	SOPHC17	Harbour Office Local Port Services
A11-5-6	SOPPG1	Pilotage -General Information
A11-5-7	SOPMC7	Pilot and Passenger Transfer Procedures
A11-5-8	SOPE2	Marine Pollution Preparedness and Response **NOTE – this will replace the version included in Appendix 1E in the Oil Spill & Marine Pollution Contingency Plan 2020-2025**
A11-5-9	SOPE4	Pollution Reporting

In summary, standard operating procedures include ones that are specific to Ship to Ship Transfer Operations such as general measures, provision of local port services, tug operations, pilotage, pilot boats, pilots and transfer procedures and pollution response.

5.6. Marine Pollution Plan

The following includes a description of Portland Harbour Authority Marine Pollution Plan. This document sets out Portland Harbour Authority's Oil Spill & Marine Pollution Contingency Plan. The 'Plan' details the contingency arrangements for responding to actual or threatened marine pollution incidents within the Portland Harbour area. If an accidental oil spill was to take place then application of the OSCP would considerably reduce the environmental effects of a spill minimising the scale and extent of an oil spill.

The Portland Harbour Authority Marine Pollution Plan applies to all marine pollution risks in the port including STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-6-1	N/A	Portland Harbour Authority Marine Pollution and Oil Spill Contingency Plan. Version 30th June 2020 **NOTE – Appendix 1E of this document to be replaced with updated SOPE2 (see Appendix 11-5-8)**

Portland Harbour Authority has updated its Plan to take account of Ship to Ship Transfer Operations. Since updating the Plan it has also updated its Standard Operating Procedure for Marine Pollution which will replace the version that currently forms a supporting appendix to the Plan.

5.7. Emergency Plan

The following includes a description of Portland Harbour Authority Emergency Plan. This document outlines the procedures, roles and responsibilities required to respond to an emergency within the port other than for marine pollution.

The applicable Portland Harbour Authority Emergency Plan for STS operations are as follows:

Appendix No.	SMS Ref	Document Title
A11-7-1	N/A	Portland Harbour Emergency Plan

In summary, this document will be an important document in support of STS operations but in reviewing the operation no specific changes are proposed.

5.8. Summary

Portland Harbour Authority compliance with the Port Marine Safety Code and it's Safety Management System has been discussed in Chapter 4. This chapter considers the measures that would be adopted in connection an oil ship to ship transfer operation at Portland. These are considered under a series of categories as follows:

- **Risk Assessments** – the Port has developed a navigational risk assessment specific to Ship to Ship Transfer Operations. This underpins the controls that are described in the sections that follow.
- **Notices in Force** - a local regulation in the form of a General Direction has been developed for Ship to Ship Transfer of Oil and a second one relating to Towage and Ship to Ship Transfers. The existing Local Notice to Mariners relating to Ballast Water Management will continue to apply as would the GD No 1 of 2016 would apply to bunkering and debunkering.
- **Controlled Commercial Documents –**Controlled commercial documents that apply to STS operations include certificate of approval to operate, Application Forms to undertake Transfer, Declarations of Compliance, Pre-Transfer checklists and meeting checklists, emergency contacts and training requirements.
- **Operations Manual - Standard Operating Procedures** - The standard operating procedures include ones that are specific to Ship to Ship Transfer Operations such as general measures, provision of local port services, tug operations, pilotage, pilot boats, pilots and transfer procedures and pollution response.
- **Marine Pollution Plan** - Portland Harbour Authority has updated its Plan to take account of Ship to Ship Transfer Operations. NOTE Appendix 1E of Portland Harbour Authority's Oil Spill & Marine Pollution Contingency Plan will be replaced with updated SOPE2 that forms part of the measures proposed for this operation.
- **Emergency Plan -** this document will be an important document in support of STS operations but in reviewing the operation no specific changes are proposed.

Implementing the measures included within each of these categories will reduce risk of proposed cargo transfers such that potential risks and impacts and are negligible.

6. Summary & Conclusion

6.1. Introduction

This document contains details of the Water Framework Directive Risk Assessment undertaken in connection with Transfer of Liquid Cargos between Vessels at anchorage or alongside berth (oil) in Portland Harbour Authority's Jurisdiction. It is prepared in support of an application being made by Portland Harbour Authority to the maritime & Coastguard Agency for an Oil Transfer Licence under The Merchant Shipping (Ship-to-Ship Transfers) Regulations 2020.

The key objectives of the water framework directive are:

- general protection of the aquatic ecology
- specific protection of unique and valuable habitats
- protection of drinking water resources
- and protection of bathing water.

The assessment considers each of the project activities and associated impact on these receptors ultimately evaluating the implications of the project on the status of the relevant waterbodies.

The Ship-to-Ship transfer locations are within the Portland Harbour and Dorset/ Hampshire waterbodies. Potential impact on the adjacent waterbodies; the Fleet Lagoon; and Weymouth Bay are also assessed due to these being connected waterbodies.

6.2. STAGE 1 – Screening

Screening excludes any activities that do not need to go through the scoping or impact assessment stages. Details of this assessment are included below.

The activity is transfer of liquid cargo between vessels (Oil) and it has been determined that it is not considered a low risk activity as defined above and furthermore the other criteria do not apply in this particular case. It is therefore necessary to go to the next stage and undertake Stage 2 scoping.

6.3. STAGE 2 – Scoping

At the scoping stage you must identify all your activity's potential risks to each receptor. The receptors taken forward to the next stage following scoping include the following:

- hydromorphology
- biology – habitats
- biology – fish
- water quality
- protected areas
- invasive non-native species (INNS)

6.4. STAGE 3 - Impact Assessment

Text to be inserted

6.5. Measures

The measures identified to reduce the overall risk to one that is acceptable are grouped as follows:

- Risk Assessments
- Notices in Force
- Controlled Commercial Documents
- Operations Manual - Standard Operating Procedures
- Marine Pollution Plan
- Emergency Plan

A robust set of measures has been introduced to ensure that the operation can be delivered in a safe manner, that ensures the risk to the environment is as low as reasonably practical and does not compromise the requirements of the Water Framework Directive.

6.6. Cumulative Assessment

In considering cumulative assessment and incombination effects vessels anchoring in Weymouth Bay are taken into account.

Portland Harbour Authority has reviewed its management system and considers that the existing measures in place continue to apply and that there are no additional measures required for STS over and above what has been introduced as part of the wider assessment of risk and associated requirements.

6.7. Conclusion

This document contains details of the Water Framework Directive Risk Assessment undertaken in connection with Transfer of Liquid Cargos between Vessels at anchorage or alongside berth (oil) in Portland Harbour Authority's Jurisdiction. It is prepared in support of an application being made by Portland Harbour Authority to the maritime & Coastguard Agency for an Oil Transfer Licence under The Merchant Shipping (Ship-to-Ship Transfers) Regulations 2020. A robust set of measures has been introduced to ensure that the operation can be delivered in a safe manner, that ensures the risk to the environment is as low as reasonably practical and does not compromise the requirements of the Water Framework Directive.

7. APPENDICES

Appendix 1i – Portland Harbour Water Body details

Appendix 1ii – Weymouth Bay Water Body details

Appendix 1iii – Dorset/Hampshire Water Body details

Appendix 1iv – Fleet Lagoon Water Body details

Appendix 2a – Scoping Report

Appendix 2b – Supporting Maps

Appendix 3a - Environment Agency Waterbody Chemical Status History Enquiry

Appendix 3b – Environment Agency Waterbody Chemical Monitoring Point

Appendix 1 i Portland Harbour Water Body

https://environment.data.gov.uk/catchment-planning/WaterBody/GB680805270000 - Retrieved 05/01/21

Catchment Data Explorer

Environment Agency

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Search

Home ▸ South West ▸ South West TraC ▸ West Dorset Rivers TraC ▸ Portland Harbour

Portland Harbour Overview

Download Water Body as CSV / GeoJSON

Overall classification for 2019
Moderate

Id	GB680805270000
Type	Coastal Water
Hydromorphological designation	heavily modified
NGR	SY6872776179
Surface area	1024.431 ha
Surface area	10.244 km2
Surveillance Water Body	No

Classifications

Cycle 2 classifications

Download as CSV

Classification Item	2013	2014	2015	2016	2019
Overall Water Body	Good	Good	Moderate	Moderate	Moderate
Ecological	Good	Good	Moderate	Moderate	Moderate
Chemical	Good	Good	Good	Good	Fail

Cycle 1 classifications Show

Upstream water bodies

No data to show

Downstream water bodies

No data to show

Investigations into classification status

Download as CSV

No data to show

Reasons for not achieving good status and reasons for deterioration

Download as CSV

RNAG	Physical modification	Other (not in list, must add details in comments)	Sector under investigation	Details	Mitigation Measures Assessment

Objectives

Download as CSV

Overall Water Body	Good	2021	
Ecological	Good	2021	
Supporting elements (Surface Water)	Good	2021	
Mitigation Measures Assessment	Good	2021	
Biological quality elements	Not assessed	2015	
Hydromorphological Supporting Elements	Not assessed	2015	
Physico-chemical quality elements	Good	2015	
Dissolved Inorganic Nitrogen	Good	2015	
Dissolved oxygen	Good	2015	
Specific pollutants	High	2015	
Arsenic	High	2015	
Copper	High	2015	
Zinc	High	2015	
Chemical	Good	2015	
Priority substances	Good	2015	
Lead and Its Compounds	Good	2015	
Nickel and Its Compounds	Good	2015	
Other Pollutants	Does not require assessment	2015	
Priority hazardous substances	Good	2015	
Cadmium and Its Compounds	Good	2015	

Protected areas

Download as CSV

Chesil & The Fleet	UK0017076	Habitats and Species Directive	SAC	Natural England
Portland Harbour Castle Cove	UK20800	Bathing Water Directive		Bathing water
THE_FLEET_R	UKSW56	Shellfish Water Directive		
Portland Harbour Sandsfoot Castle	UK20900	Bathing Water Directive		Bathing water

Issues preventing waters reaching good status

Issues preventing waters reaching good status and the sectors identified as contributing to them are shown in a table in the new summary page.

View Table

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FAQs

Announcements

Terms and Conditions

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Appendix 1 ii Weymouth Bay Water Body

https://environment.data.gov.uk/catchment-planning/WaterBody/GB680805070000

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Weymouth Bay Overview

Download Water Body as CSV / GeoJSON

Overall classification for 2019
Moderate

Id	GB680805070000
Type	Coastal Water
Hydromorphological designation	heavily modified
NGR	SY6923379414
Surface area	790.402 ha
Surface area	7.904 km2
Surveillance Water Body	No

Classifications

Cycle 2 classifications

Download as CSV

Classification Item	2013	2014	2015	2016	2019
Overall Water Body	Good	Good	Moderate	Moderate	Moderate
Ecological	Good	Good	Moderate	Moderate	Moderate
Chemical	Good	Good	Good	Good	Fail

Cycle 1 classifications Show

Upstream water bodies

WEY

Downstream water bodies

No data to show

Investigations into classification status

Download as CSV

No data to show

Reasons for not achieving good status and reasons for deterioration

Download as CSV

RNAG	Physical modification	Other (not in list, must add details in comments)	Sector under investigation	Details	Mitigation Measures Assessment

Objectives

Download as CSV

Overall Water Body	Good	2021	
Ecological	Good	2021	
Supporting elements (Surface Water)	Good	2021	
Mitigation Measures Assessment	Good	2021	
Biological quality elements	Not assessed	2015	
Hydromorphological Supporting Elements	Not assessed	2015	
Physico-chemical quality elements	Good	2015	
Dissolved oxygen	Good	2015	
Specific pollutants	Not assessed	2015	
Chemical	Good	2015	
Priority substances	Does not require assessment	2015	
Other Pollutants	Does not require assessment	2015	
Priority hazardous substances	Does not require assessment	2015	

Protected areas

Download as CSV

Isle of Portland to Studland Cliffs	UK0019861	Habitats and Species Directive	SAC	Natural England
Weymouth Lodmoor	UK20600	Bathing Water Directive		Bathing water
Weymouth Central	UK20700	Bathing Water Directive		Bathing water
Bowleaze Cove	UK20400	Bathing Water Directive		Bathing water
PORTLAND HARBOUR EAST	UKSW57	Shellfish Water Directive		

Issues preventing waters reaching good status

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View Table

Support

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FAQs

Announcements

Terms and Conditions

Privacy Notice

About This Page

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Appendix 1 iii Dorset Water Body

https://environment.data.gov.uk/catchment-planning/WaterBody/GB620705550000

Retrieved 05/01/2021

Catchment Data Explorer

Environment Agency

Dorset / Hampshire Overview

Download Water Body as CSV / GeoJSON

Overall classification for 2019
Moderate

Id	GB620705550000
Type	Coastal Water
Hydromorphological designation	not designated artificial or heavily modified
NGR	SZ1119879772
Surface area	51310.556 ha
Surface area	513.106 km2
Surveillance Water Body	No

Classifications

Cycle 2 classifications

Download as CSV

Classification Item	2013	2014	2015	2016	2019
Overall Water Body	Good	Good	Moderate	Moderate	Moderate
Ecological	Good	Good	Moderate	Moderate	Good
Chemical	Good	Good	Good	Good	Fail

Cycle 1 classifications Show

Upstream water bodies

Bourne Stream
POOLE HARBOUR
CHRISTCHURCH HARBOUR
Swan (Swanage)
Becton Bunny
Atherfield Stream
Brighstone Streams

Downstream water bodies

No data to show

Investigations into classification status

Download as CSV

No data to show			

Reasons for not achieving good status and reasons for deterioration

Download as CSV

RNAG	Diffuse source	Coastal Background DIN	No sector responsible	Details	Dissolved Inorganic Nitrogen
RNAG	Point source	Sewage discharge (continuous)	Water Industry	Details	Dissolved Inorganic Nitrogen
RNAG	Diffuse source	Poor nutrient management	Agriculture and rural land management	Details	Dissolved Inorganic Nitrogen
RNAG	Diffuse source	Poor nutrient management	Agriculture and rural land management	Details	Dissolved Inorganic Nitrogen
RNAG	Diffuse source	Atmospheric deposition	Other	Details	Dissolved Inorganic Nitrogen

Objectives

Download as CSV

Overall Water Body	Good	2021	
Ecological	Good	2021	
Supporting elements (Surface Water)	Not assessed	2015	
Biological quality elements	Good	2015	
Invertebrates	Good	2015	
Phytoplankton	Good	2015	
Hydromorphological Supporting Elements	Not assessed	2015	
Physico-chemical quality elements	Good	2021	
Dissolved Inorganic Nitrogen	Good	2021	
Dissolved oxygen	High	2015	
Specific pollutants	High	2015	
Arsenic	High	2015	
Copper	High	2015	
Zinc	High	2015	
Chemical	Good	2015	
Priority substances	Good	2015	
Lead and Its Compounds	Good	2015	
Nickel and Its Compounds	Good	2015	
Other Pollutants	Does not require assessment	2015	
Priority hazardous substances	Good	2015	
Cadmium and Its Compounds	Good	2015	

Protected areas

Download as CSV

Solent & Southampton Water	UK9011061	Conservation of Wild Birds Directive	SPA	Natural England
Poole Sandbanks Peninsular	UK19350	Bathing Water Directive		Bathing water
Studland to Portland	UK0030382	Habitats and Species Directive	SAC	Natural England
Lulworth Cove	UK20000	Bathing Water Directive		Bathing water
Isle of Portland to Studland Cliffs	UK0019861	Habitats and Species Directive	SAC	Natural England
Bournemouth Fisherman`s Walk	UK19030	Bathing Water Directive		Bathing water
Christchurch Bay	UK17200	Bathing Water Directive		Bathing water
South Wight Maritime	UK0030061	Habitats and Species Directive	SAC	Natural England
Isle of Wight Downs	UK0016254	Habitats and Species Directive	SAC	Natural England
Swanage Central	UK19800	Bathing Water Directive		Bathing water
Dorset Heaths	UK0019857	Habitats and Species Directive	SAC	Natural England

St Albans Head to Durlston Head	UK0019863	Habitats and Species Directive	SAC	Natural England
Dorset Heaths (Purbeck & Wareham) & Studland Dunes	UK0030038	Habitats and Species Directive	SAC	Natural England
Bournemouth Pier	UK19100	Bathing Water Directive		Bathing water
Christchurch Highcliffe Castle	UK18700	Bathing Water Directive		Bathing water
Poole Harbour and Holes Bay	UKENCA117	Urban Waste Water Treatment Directive		
PORTLAND HARBOUR EAST	UKSW57	Shellfish Water Directive		
POOLE BAY	UKSW55	Shellfish Water Directive		
Durdle Door East	UK20100	Bathing Water Directive		Bathing water
Highcliffe	UK17300	Bathing Water Directive		Bathing water
Bournemouth Boscombe Pier	UK19060	Bathing Water Directive		Bathing water
SHAMBLES BANK	UKSW59	Shellfish Water Directive		
Kimmeridge Bay	UK19900	Bathing Water Directive		Bathing water
Church Ope Cove	UK20500	Bathing Water Directive		Bathing water
Ringstead Bay	UK20300	Bathing Water Directive		Bathing water
Durdle Door West	UK20200	Bathing Water Directive		Bathing water
Studland Knoll House	UK19700	Bathing Water Directive		Bathing water
Shell Bay North	UK19600	Bathing Water Directive		Bathing water
POOLE HARBOUR NORTH	UKSW52	Shellfish Water Directive		
Poole Shore Road Beach	UK19200	Bathing Water Directive		Bathing water
Bournemouth Durley Chine	UK19150	Bathing Water Directive		Bathing water
Bournemouth Alum Chine	UK19160	Bathing Water Directive		Bathing water
Compton Bay	UK17400	Bathing Water Directive		Bathing water
Poole Branksome Chine	UK19170	Bathing Water Directive		Bathing water
Milford-on-sea	UK17100	Bathing Water Directive		Bathing water
Bournemouth Hengistbury West	UK19000	Bathing Water Directive		Bathing water
Bournemouth Southbourne	UK19020	Bathing Water Directive		Bathing water
Poole Canford Cliffs Chine	UK19190	Bathing Water Directive		Bathing water

Issues preventing waters reaching good status

Issues preventing waters reaching good status and the sectors identified as contributing to them are shown in a table in the new summary page.

View Table

Support

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FAQs

Announcements

Terms and Conditions

Privacy Notice

About This Page

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Appendix 1 iv Fleet Water Body

https://environment.data.gov.uk/catchment-planning/WaterBody/GB510080077000

Retrieved 05/01/2021

Catchment Data Explorer

Environment Agency

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Search

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Fleet Lagoon Overview

Download Water Body as CSV / GeoJSON

Overall classification for 2019
Moderate

Id	GB510080077000
Type	Transitional Water
Hydromorphological designation	not designated artificial or heavily modified
NGR	SY6286279781
Surface area	493.773 ha
Surface area	4.938 km2
Surveillance Water Body	Yes

Classifications

Cycle 2 classifications

Download as CSV

Classification Item	2013	2014	2015	2016	2019
Overall Water Body	Moderate	Moderate	Moderate	Moderate	Moderate
Ecological	Moderate	Moderate	Moderate	Moderate	Moderate
Chemical	Good	Good	Good	Good	Fail

Cycle 1 classifications Show

Upstream water bodies

No data to show

Downstream water bodies

Lyme Bay East

Investigations into classification status

Download as CSV

No data to show

Reasons for not achieving good status and reasons for deterioration

Download as CSV

RNAG	Diffuse source	Poor nutrient management	Agriculture and rural land management	Details	Phytoplankton
RNAG	Diffuse source	Poor nutrient management	Agriculture and rural land management	Details	Dissolved Inorganic Nitrogen

Objectives

Download as CSV

Overall Water Body	Moderate	2015	Unfavourable balance of costs and benefits
Ecological	Moderate	2015	Unfavourable balance of costs and benefits
Supporting elements (Surface Water)	Not assessed	2015	
Biological quality elements	Moderate	2015	Unfavourable balance of costs and benefits
Phytoplankton	Moderate	2015	Unfavourable balance of costs and benefits
Hydromorphological Supporting Elements	High	2015	
Hydrological Regime	High	2015	
Physico-chemical quality elements	Moderate	2015	Unfavourable balance of costs and benefits
Dissolved Inorganic Nitrogen	Moderate	2015	Unfavourable balance of costs and benefits
Dissolved oxygen	High	2015	
Specific pollutants	Not assessed	2015	
Chemical	Good	2015	
Priority substances	Does not require assessment	2015	
Other Pollutants	Does not require assessment	2015	
Priority hazardous substances	Does not require assessment	2015	

Protected areas

Download as CSV

Chesil & The Fleet	UK0017076	Habitats and Species Directive	SAC	Natural England
COASTAL STREAMS TO FLEET LAGOON NVZ S710	S710	Nitrates Directive		
Horsepool NVZ S691	S691	Nitrates Directive		
Chesil Beach & the Fleet	UK9010091	Conservation of Wild Birds Directive	SPA	Natural England
PORTLAND HARBOUR EAST	UKSW57	Shellfish Water Directive		
PORTLAND HARBOUR WEST	UKSW58	Shellfish Water Directive		

Issues preventing waters reaching good status

Issues preventing waters reaching good status and the sectors identified as contributing to them are shown in a table in the new summary page.

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Support

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FAQs

Announcements

Terms and Conditions

Privacy Notice

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Appendix 2a - Water Framework Directive assessment: scoping results for Transfer of Liquid Cargo between vessels at anchorage or at alongside berths (Oil) in Portland Harbour Jurisdiction

The findings of this scoping stage of the Water Framework Directive (WFD) assessment have been included below using the EA template.
Only one template has been completed as the activity will:

- Not take place in or affect more than one water body, complete a template for each water body
- Does not include several different activities or stages as part of a larger project

The WFD assessment guidance for estuarine and coastal waters has been used to complete the table.

Part 1

	Description, notes or more information
Applicant name	Portland Harbour Authority Ltd
Application reference number (where applicable)	
Name of activity	Transfer of Liquid Cargo between vessels at anchorage or at alongside berths (Oil)
Brief description of activity	The activities identified in the Pressures/Activity matrix are as follows • Transport – Vessel Discharge/Emissions • Transport – Vessel Movements This mirrors the activities assessed in the Habitats Regulation Assessment For the purposes of the environmental assessment the risks associated with the activities are considered to be: • Movement and presence of vessels • Accidental oil spill • Discharge of ballast water during transfer process. The liquid cargoes to be transferred are categorised as follows: • Light Crude Oils • Medium Crude Oils • Heavy Crude Oils • Light Oils • Heavy Fuel Oils
Location of activity (central point XY coordinates or national grid reference)	

Type	Name	WGS 84 Latitude (DM)	WGS 84 Longitude (DM)	OSGB1936 Easting	OSGB1936 Northing
Anchorages:					
Outer Harbour	G6	50 34.3541	-2 26.2966	369060	74850
Inner Harbour:	M6	50 34.3756	-2 26.3307	369020	74890
Alongside berths:					
Inner Harbour					
	Queens Pier 5 & 7	50 34.8187	-2 26.1314	369260	75710
	Queens Pier 6 & 8	50 35.4844	-2 24.0694	371700	76930

Footprint of activity (ha)	For the purposes of the environmental assessment, the footprint is considered to be as follows: • **Movement and presence of vessels –** The activity is taking place in locations where vessel activity already takes place therefore no additional disturbance over and above normal port/ vessel activity anticipated. No further assessment for the purpose of WFD

	• **Accidental oil spill –** a precautionary assessment has been applied in which the waterbody in which the activity is located is taken into account in their entirety. The same applies for the Fleet however in the case of the Dorset/ Hampshire Waterbody a 2.5km buffer has been applied to the location where this activity will take place. • **Discharge of ballast water during transfer process** – a precautionary assessment has been applied in which the waterbody in which the activity is located and adjacent waterbodies are taken into account in their entirety. The same applies for the Fleet however in the case of the Dorset/ Hampshire Waterbody a 2.5km buffer has been applied to the location where this activity will take place.
Timings of activity (including start and finish dates)	• Estimated start date – July 2021 • Estimated finish date – n/a ongoing
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	• Estimated 4 Transfers per month. • Anticipated this will be less frequent at start increasing with time as the activity becomes more established. • For further details see Chapter 3 of Environmental Assessment.
Use or release of chemicals (state which ones)	• No release of chemicals to water proposed however for the purposes of environmental and this assessment the unlikely event of accidental oil spill is taken into account as a precautionary measure.

Part 2

Note: The table below has been populated using catchment data explorer where available (https://environment.data.gov.uk/catchment-planning/). Where no information is given on the catchment data explorer, details from the water body summary table given in the guidance is used (https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters)

Water body[1]	**Description, notes or more information**			
WFD water body name	**Portland Harbour**	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
Water body ID	GB680805270000	GB620705550000	GB680805070000	GB510080077000
River basin district name	South West	South West	South West	South West
Water body type (estuarine or coastal)	Coastal	Coastal	Coastal	Estuarine
Water body total area (ha)	1024.43	51310.6	790.4	493.77
Overall water body status (2019)	Moderate	Moderate	Moderate	Moderate
Ecological status	Moderate	Good	Moderate	Moderate
Chemical status	Fail	Fail	Fail	Fail
Target water body status and deadline	Good by 2021	Good by 2021	Good by 2021	Moderate by 2015
Hydromorphology status of water body	Not Assessed	Supports Good	Not Assessed	Supports Good
Heavily modified water body and for what use	Yes: Coastal Protection; Navigation, Ports and Harbours	Not designated artificial or heavily modified	Yes: Coastal Protection; Navigation, Ports and Harbours	Not designated artificial or heavily modified
Higher sensitivity habitats present	Yes	Yes	Yes	Yes
Lower sensitivity habitats present	Yes	Yes	Yes	Yes
Phytoplankton status	High	High	Not Assessed	Good
History of harmful algae	Yes	Not Monitored	Not Monitored	Yes
WFD protected areas within 2km	Yes	Yes	Yes	Yes

[1] *Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters.* Please see **Appendix Bi** for a location plan of the assessment area an waterbodies assessed

Specific risk information

Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider invasive non-native species (INNS).

Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity. Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

Consider if your activity:	**Yes**	**No**	**Hydromorphology risk issue(s)**			
			Portland Harbour	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	**Requires impact assessment**	**Impact assessment not required**	NO (The overall waterbody status is classified as Moderate not High)	NO (The overall waterbody status is classified as Moderate not High)	NO (The overall waterbody status is classified as Moderate not High)	NO (The overall waterbody status is classified as Moderate not High)
Could significantly impact the hydromorphology of any water body	**Requires impact assessment**	**Impact assessment not required**	NO The proposed activities do not impact the hydromorphology of the waterbody	NO The proposed activities do not impact the hydromorphology of the waterbody	NO The proposed activities do not impact the hydromorphology of the waterbody	NO The proposed activities do not impact the hydromorphology of the waterbody
Is in a water body that is heavily modified for the same use as your activity	**Requires impact assessment**	**Impact assessment not required**	YES Waterbody heavily modified for Navigation, Ports and Harbours Activities are: • Transport – Vessel Discharge/Emissions • Transport – Vessel Movements	NO The waterbody is not classed as heavily modified.	YES Waterbody heavily modified for Navigation, Ports and Harbours Activities are: • Transport – Vessel Discharge/Emissions • Transport – Vessel Movements	NO The waterbody is not classed as heavily modified.

Record the findings for hydromorphology and go to section 2: biology.

Section 2: Biology

Habitats

Consider if habitats are at risk from your activity.

Use the water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.

Higher sensitivity habitats [2]	Lower sensitivity habitats [3]
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

[2] *Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.*
[3] *Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.*

Consider if the footprint[4] of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**			
			Portland Harbour	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
0.5km² or larger	**Yes to one or more – requires impact assessment**	**No to all – impact assessment not required**	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. For the purposes of this WFD assessment the unlikely event of accidental oil spill is taken into account, therefore the impact on all habitats are taken forward to impact assessment as a precautionary measure.	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. For the purposes of this WFD assessment the unlikely event of accidental oil spill is taken into account, therefore the impact on all habitats located in the vicinity of the transfer location (2.5 km from the central point of the anchorage) are taken forward to impact assessment as a precautionary measure.	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. For the purposes of this WFD assessment the unlikely event of accidental oil spill is taken into account, therefore the impact on all habitats are taken forward to impact assessment as a precautionary measure.	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. For the purposes of this WFD assessment the unlikely event of accidental oil spill is taken into account, therefore the impact on all habitats are taken forward to impact assessment as a precautionary measure.
1% or more of the water body's area			YES As above	YES As above	YES As above	YES As above
Within 500m of any higher sensitivity habitat			YES See **appendix 2bii** As above, all higher sensitivity habitats for waterbody taken forward to impact assessment as a precautionary measure. Higher Sensitivity Habitats within this waterbody are: • Subtidal Kelp Beds • Subtidal Seagrass Beds	YES See **appendix 2bii** As above, those higher sensitivity habitats limited to the part of this waterbody located in the vicinity of the transfer location (2.5 km from the central point of the anchorage) have been taken forward to impact assessment as a precautionary measure.	YES See **appendix 2bii** As above, all higher sensitivity habitats for waterbody taken forward to impact assessment as a precautionary measure. Higher Sensitivity Habitats within this waterbody are: • Subtidal Kelp Beds • Subtidal Seagrass Beds	YES See **appendix 2bii** As above, all higher sensitivity habitats for waterbody taken forward to impact assessment as a precautionary measure. Higher Sensitivity Habitats within this waterbody are: • Saltmarsh • Subtidal Seagrass Beds

				Higher Sensitivity Habitats identified are: • Chalk Reef		
1% or more of any lower sensitivity habitat			YES See **appendix 2biii** As above, all lower sensitivity habitats for waterbody taken forward to impact assessment as a precautionary measure. Lower Sensitivity Habitats within this waterbody are: • Cobbles, gravel and shingle • Intertidal soft sediment • Rocky shore • Subtidal rocky reef • Subtidal soft sediments	YES See **appendix 2biii** As above those lower sensitivity habitats limited to the part of this waterbody located in the vicinity of the transfer location (2.5 km from the central point of the anchorage) have been taken forward to impact assessment as a precautionary measure. Lower Sensitivity Habitats identified are: • Cobbles, gravel and shingle • Subtidal rocky reef • Subtidal soft sediments	YES See **appendix 2biii** All lower sensitivity habitats for waterbody taken forward to impact assessment as a precautionary measure. Lower Sensitivity Habitats within this waterbody are: • Cobbles, gravel and shingle • Intertidal soft sediment • Subtidal rocky reef • Subtidal soft sediments	YES See **appendix 2biii** All lower sensitivity habitats for waterbody taken forward to impact assessment as a precautionary measure. Lower Sensitivity Habitats within this waterbody are: • Intertidal soft sediment

[4] *Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.*

Fish

Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.

Consider if your activity:	Yes	No	Biology fish risk issue(s)			
			Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	NO Site is not an estuary	NO Site is not an estuary	NO Site is not an estuary	NO Although site is considered to be an estuary the activity is not taking place in the waterbody therefore this is not taken forward to impact assessment
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	NO Site is not an estuary	NO Site is not an estuary	NO Site is not an estuary	NO Although site is considered to be an estuary the activity is not taking place in the waterbody therefore this is not taken forward to impact assessment
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	NO Site is not an estuary	NO Site is not an estuary	NO Site is not an estuary	NO Although site is considered to be an estuary the activity is not taking place in the waterbody therefore this is not taken forward to impact assessment

Record the findings for biology habitats and fish and go to section 3: water quality.

Section 3: Water quality

Consider if water quality is at risk from your activity.

Use the water body summary table to find information on phytoplankton status and harmful algae.

Consider if your activity:	Yes	No	Water quality risk issue(s)			
			Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment	Impact assessment not required	NO The activity is unlikely to affect water clarity, temperature, salinity, oxygen levels, nutrients, or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	NO The activity is unlikely to affect water clarity, temperature, salinity, oxygen levels, nutrients, or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	NO The activity is unlikely to affect water clarity, temperature, salinity, oxygen levels, nutrients, or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	NO The activity is unlikely to affect water clarity, temperature, salinity, oxygen levels, nutrients, or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment	Impact assessment not required	NO Phytoplankton status is high	NO Phytoplankton status is high	NO Phytoplankton status is not assessed	NO Phytoplankton status is good
Is in a water body with a history of harmful algae	Requires impact assessment	Impact assessment not required	YES See impact assessment for details	YES Note: History of harmful algae is not monitored however taken forward as precautionary measure	YES Note: History of harmful algae is not monitored however taken forward as precautionary measure	YES See impact assessment for details

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)			
			Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires. impact assessment	Impact assessment not required	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.
It disturbs sediment with contaminants above Cefas Action Level 1	Requires impact assessment	Impact assessment not required	NO The activity does cause any additional sediment disturbance over and above normal port/ vessel activity.	NO The activity does cause any additional sediment disturbance over and above normal port/ vessel activity.	NO Activity does not take place in water body	NO Activity does not take place in water body

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	**Yes**	**No**	**Water quality risk issue(s)**			
			Portland Harbour	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment[5]	Impact assessment not required	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.	YES Although chemicals are not released as part of the activity in the unlikely event of an accidental oil spill chemicals on the EQSD list may be released therefore this is taken forward to impact assessment as a precautionary measure.

[5] *Carry out your impact assessment using the Environment Agency's surface water pollution risk assessment guidance, part of Environmental Permitting Regulations guidance.*

Record the findings for water quality go on to section 4: WFD protected areas.

Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- special areas of conservation (SAC)
- special protection areas (SPA)
- shellfish waters
- bathing waters
- nutrient sensitive areas

Note Use Magic maps to find information on the location of protected areas in your water body (and adjacent water bodies) within 2km of your activity.

Consider if your activity is:	**Yes**	**No**	**Protected areas risk issue(s)**			
			Portland Harbour	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
Within 2km of any WFD protected area[6]	**Requires impact assessment**	**Impact assessment not required**	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. In the unlikely event of an accidental oil spill impacts on protected areas are taken forward to impact assessment as a precautionary measure. The following WFD protected areas are located within the Waterbody and the impact on these is assessed as a precautionary measure. • **Special Areas of Conservation (SAC)** *Chesil and The Fleet* • **Special Protection Areas (SPA):** None • **Shellfish Waters** *Note: While MAGIC map interrogation showed that: Portland Harbour East and; Portland Harbour West are within the Portland Harbour Waterbody, they are not listed on Catchment Data Explorer and no longer classified as production sites.* *Both sites are taken forward to impact assessment as a precautionary measure* • **Bathing Waters** *Portland Harbour Castle Cove*	NO The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. In the unlikely event of an accidental oil spill potential impacts on protected areas were considered as a precautionary measure. Due to the large size of the Dorset/Hampshire waterbody a 2.5km buffer has been used to select any protected areas which occur in this waterbody. None were found. See **Appendix 2biv** with details of the MAGIC Map interrogation	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. In the unlikely event of an accidental oil spill potential impacts on protected areas were considered as a precautionary measure. The following WFD protected areas are located within the Waterbody and the impact on these is assessed as a precautionary measure. • **Special Areas of Conservation (SAC)** *Isle of Portland to Studland Cliffs* • **Special Protection Areas (SPA)** None • **Shellfish Waters** *Portland Harbour East* *Note: Only a small portion of this shellfish water appears to be in Weymouth Bay Waterbody and appears to be in error. Impact assessment for this area is covered under the Portland Harbour Waterbody.* • **Bathing Waters** *Weymouth Lodmoor* *Weymouth Central* *Bowleaze Cove* • **Nutrient Sensitive Areas** *None* See **Appendix 2biv** details of the MAGIC Map interrogation	YES The activity does cause any additional sediment disturbance over and above normal port/ vessel activity. In the unlikely event of an accidental oil spill potential impacts on protected areas were considered as a precautionary measure. The following WFD protected areas are located within the Waterbody and the impact on these is assessed as a precautionary measure. • **Special Areas of Conservation (SAC)** *Chesil and The Fleet* • **Special Protection Areas (SPA)** *Chesil Beach & The Fleet* • **Shellfish Waters** *Note: While MAGIC map interrogation showed that: The Fleet Is within the Portland Harbour Waterbody, however they are not listed on Catchment Data Explorer as protected sites This is taken forward to impact assessment as a precautionary measure* **Bathing Waters** *None* **Nutrient Sensitive Areas** *Coastal Streams to Fleet Lagoon NVZ S710* *Horsepool NVZ S691*

			Portland Harbour *Sandsfoot Castle* • **Nutrient Sensitive Areas** *None* See **Appendix 2biv** with details of the MAGIC Map interrogation			See **Appendix 2biv** with details of the MAGIC Map interrogation

[6] *Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.*

Record the findings for WFD protected areas and go to section 5: invasive non-native species.

Section 5: Invasive non-native species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- materials or equipment that have come from, had use in or travelled through other water bodies
- activities that help spread existing INNS, either within the immediate water body or other water bodies

Consider if your activity could:	**Yes**	**No**	**INNS risk issue(s)**			
			Portland Harbour	**Dorset/ Hampshire**	**Weymouth Bay**	**Fleet Lagoon**
Introduce or spread INNS	**Requires impact assessment**	**Impact assessment not required**	YES Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS	YES Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS	YES Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS	YES Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS

Record the findings for INNS and go to the summary section.

Summary - Summarise the results of scoping here.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment			
		Portland Harbour	Dorset/ Hampshire	Weymouth Bay	Fleet Lagoon
S-1 Hydromorphology	YES for Portland Harbour and Weymouth Bay	YES Impact assessment required • Waterbody heavily modified for same use as activity: Navigation, Ports and Harbours	NO Impact assessment not required • waterbody not heavily modified	YES Impact assessment required • Waterbody heavily modified for same use as activity: Navigation, Ports and Harbours	NO Impact assessment not required • waterbody not heavily modified
S-2 Biology: habitats	YES	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats located in the vicinity of the transfer location (2.5 km from the central point of the anchorage) are taken forward to impact assessment	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment	YES Impact assessment required • Activity is the same as existing use so no additional impact above normal port/vessel operations, but due to the risk of accidental oil spill all higher and lower sensitivity habitats for this waterbody are taken forward to impact assessment
S-2 Biology: fish	NO	NO Impact assessment is not required • Site is not an estuary	NO Impact assessment is not required • Site is not an estuary	NO Impact assessment is not required • Site is not an estuary	NO Impact assessment is not required • Although site is considered to be an estuary the activity is not taking place in the waterbody therefore this is not taken forward to impact assessment
S-3 Water quality	YES	YES Impact assessment required • Waterbody has a history of harmful algae • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.	YES Impact assessment required • History of harmful algae is not monitored however taken forward as precautionary measure. • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.	YES Impact assessment required • Waterbody has a history of harmful algae • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.	YES Impact assessment required • History of harmful algae is not monitored however taken forward as precautionary measure. • No chemicals are released for this activity, but due to the risk of accidental oil spill, chemicals on the EQSD list could be released and the potential impact on water quality is taken forward to impact assessment as precautionary measure.
S-4 Protected areas	YES	YES Impact assessment required Activity is the same as existing use so no additional impact	NO Impact assessment not required	YES Impact assessment required Activity is the same as existing use so no additional impact	YES Impact assessment required Activity is the same as existing use so no additional impact

		above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • Special Areas of Conservation • Shellfish Waters, and • Bathing Waters are taken forwards to impact assessment as a precautionary measure.	No protected areas within this waterbody are located within 2.5 km from the central point of the anchorages or berths	above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • Special Areas of Conservation, and • Bathing Waters are taken forwards to impact assessment as a precautionary measure.	above normal port/vessel operations, but due to the risk of accidental oil spill impact on all protected areas in the waterbody including: • Special Areas of Conservation • Special Protection Areas • Shellfish Waters • Nutrient Sensitive Areas are taken forwards to impact assessment as a precautionary measure.
S-5 Invasive non-native species	YES	YES Impact assessment required Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS	YES Impact assessment required Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS	YES Impact assessment required Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS	YES Impact assessment required Activity may involve discharge of ballast water which could result in the potential introduction or spread of INNS

If you haven't identified any receptors at risk during scoping, you don't need to continue to the impact assessment stage and your WFD assessment is complete.
If you've identified one or more receptors at risk during scoping, you should continue to the impact assessment stage.
Include your scoping results in the WFD assessment document you send to your activity's regulator as part of your application for permission to carry out the activity.

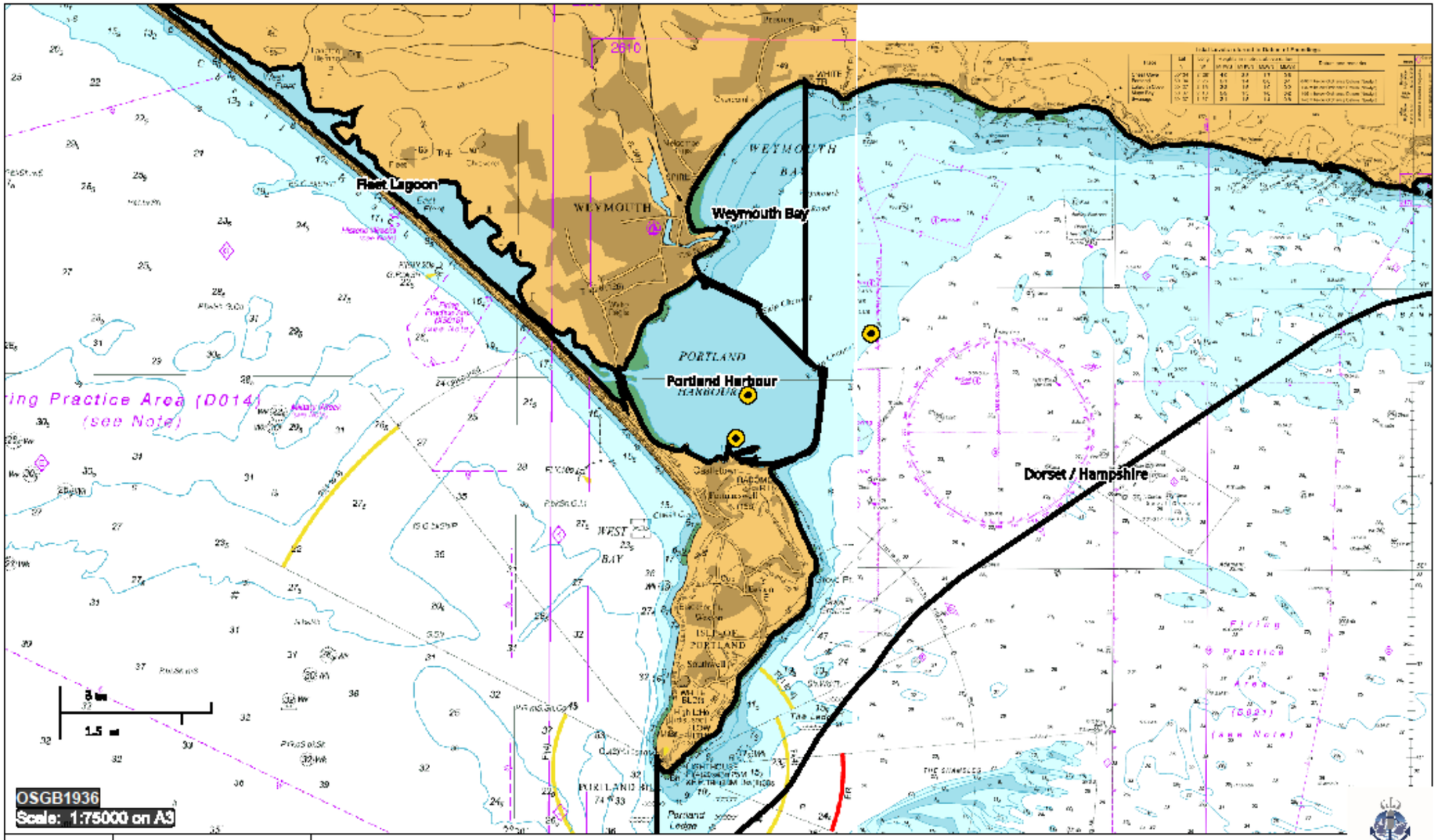

Figure No:	Figure No
Title:	Title
Project:	Project No.
Drawing Reference:	Drawing Ref.

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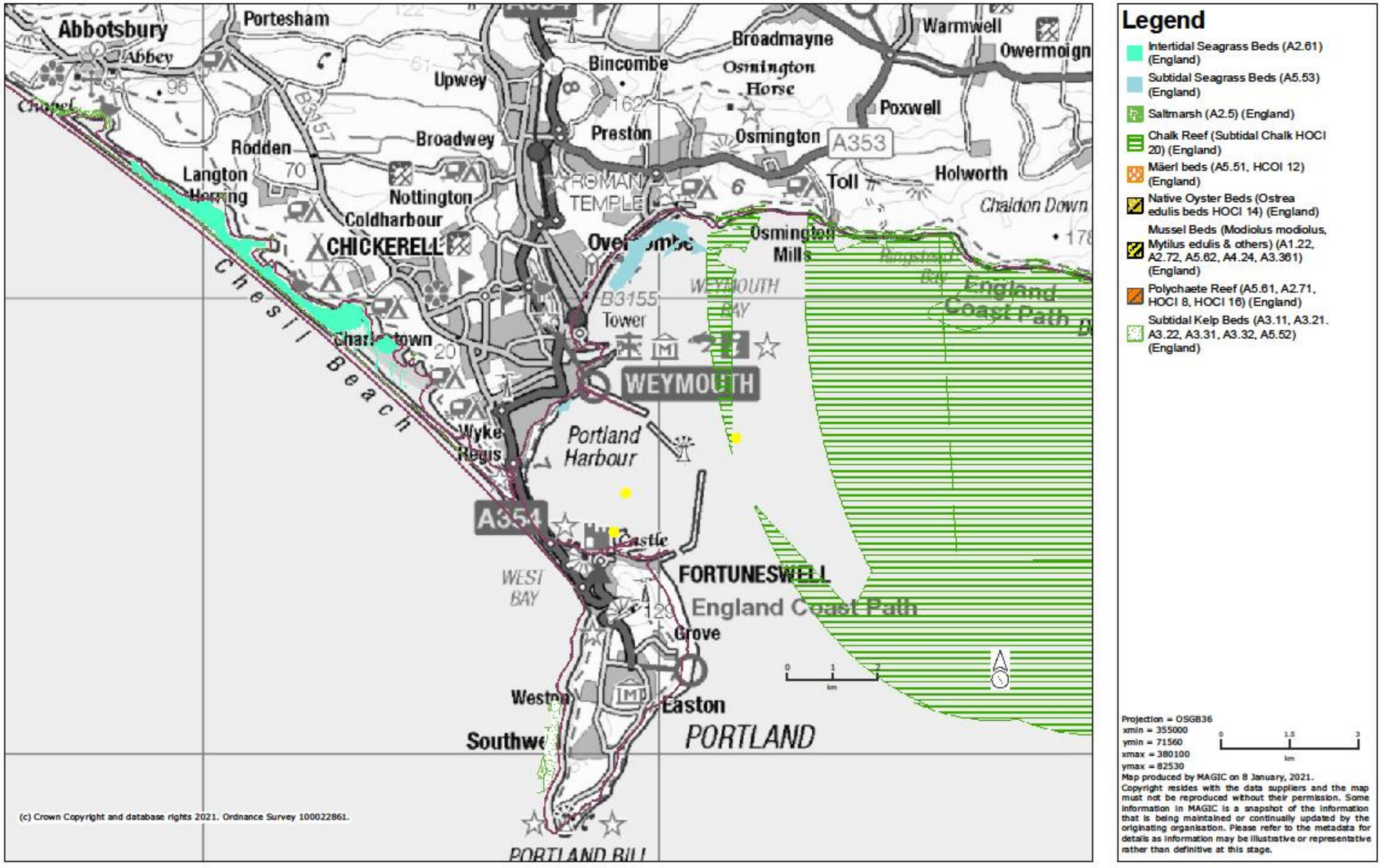
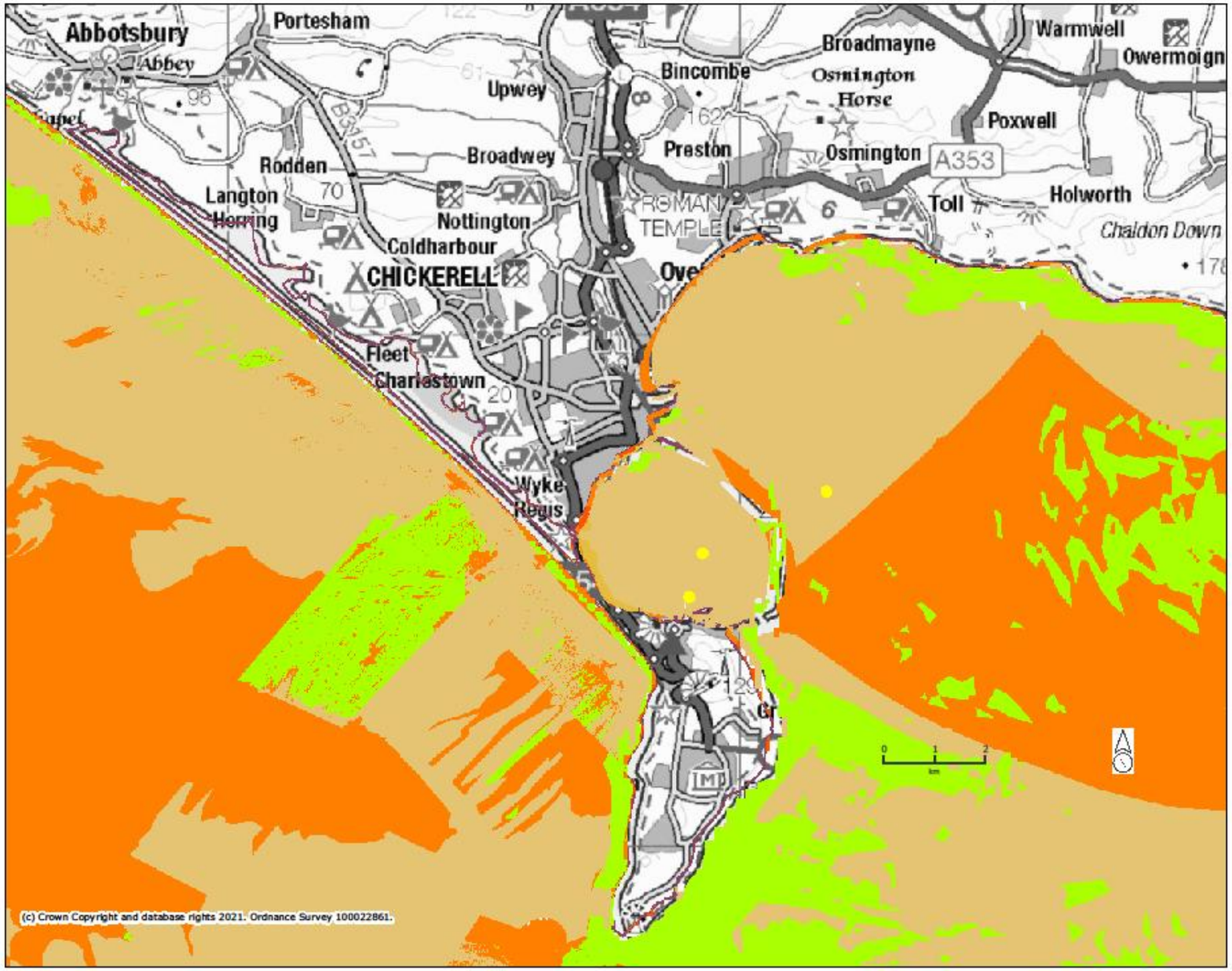
MAGIC

WFD Higher Sensitivity Habitat - STS Locations Yellow Points



MAGIC

WFD Lower Sensitivity Habitat - STS Locations Yellow Points



Legend

- Gravel & Cobbles (intertidal & subtidal coarse sediment A2.1, A5.1) (England)
- Intertidal Soft Sediment (Sand, Mud & Mixed A2.2, A2.3, A2.4) (England)
- Subtidal Soft Sediment (Sand, Mud & Mixed A5.2, A5.3, A5.4) (England)
- Rockyshore (Intertidal rock A1) (England)
- Subtidal Boulder Field (A3.123, A3.2112, A3.7162) (England)
- Subtidal Rocky Reef (Infralittoral and Circalittoral rock A3, A4) (England)

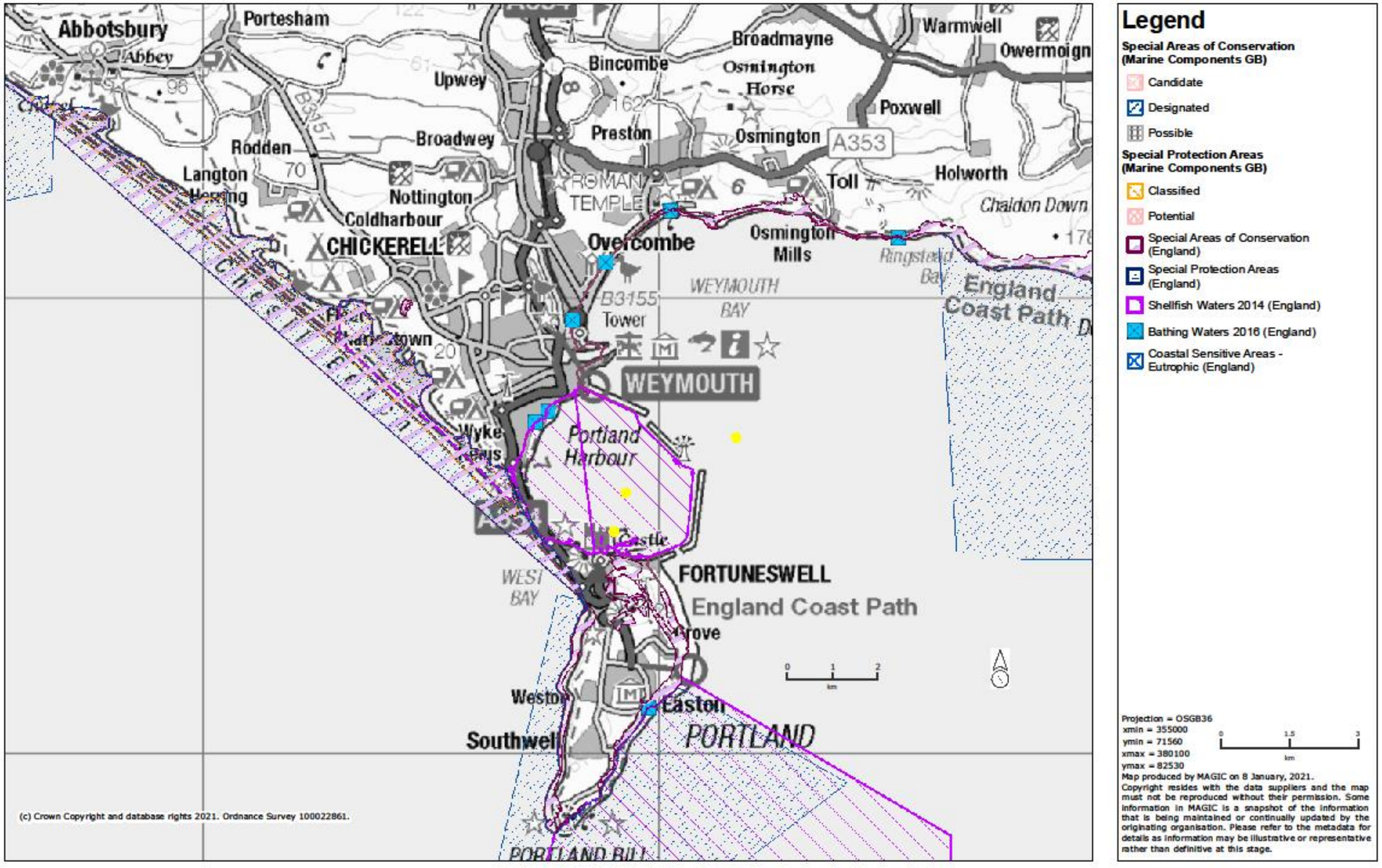
Projection = OSGB36
xmin = 355000
ymin = 71560
xmax = 380100
ymax = 82530

0 1.5 3
km

Map produced by MAGIC on 8 January, 2021.

MAGIC

WFD Protected Areas- STS Locations Yellow Points



Appendix 3a

Subject: 201841-WX : 2019 WFD Chemical Status Failure Enquiry - Final due date 17 February 2021

From: Wessex Enquiries <WessexEnquiries@environment-agency.gov.uk>
To: Frank Cox f.cox@portland-port.co.uk
Date: 25/01/2021

RE: Request for information under the Freedom of Information Act 2000 (FOIA) / Environmental Information Regulations 2004 (EIR)

Thank you very much for your enquiry and using Catchment Data explorer before contacting us. We have received the response below;

'I have set out the reasons for the change below but please feel free to respond should this not satisfy the questions you have.

Firstly it is important to understand that there has been no significant change in the concentrations of these chemicals.

The change in classification has originated from a better understanding of their behaviour once released into the environment, as a result the environmental standard used by the environment agency has been significantly reduced.

In 2013 the EU Priority Substances Directive set biota EQSs for eleven substances. 'Polybrominated diphenyl ethers' (PBDE) and 'Mercury and Its Compounds' were among these eleven.

Biota standards are environmental quality standards (biota EQSs) based on the concentrations of specific chemicals in the tissues of aquatic animals. We measure concentrations in fish, crustaceans (signal crayfish) and molluscs (blue mussels).

These biota standards are set to assess the risks to wildlife and people from chemical levels building up in them, as some chemicals bioaccumulate as they pass up the food chain.

By analysing the tissues of aquatic animals we are able to directly assess the levels of chemicals within these animals, and can better understand the risk this creates to them, and also the potential risk to humans from consumption of aquatic animals. Biota monitoring is better than assessing the potential risk by using water samples alone.

This change in monitoring has enabled a better understanding of the levels of these substances in the water environment. In essence it is likely that the levels of these substances in the locations you mention has changed little since the last classification in 2016.

The change in status is most likely as a result of our method of classification and ability to more accurately monitor and report on the levels of those substances.'

I hope that we have correctly interpreted your request. Please refer to the Open Government Licence which explains the permitted use of this information.

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

If you are not satisfied with our response to your request for information you can contact us within two calendar months to ask for our decision to be reviewed.

Yours sincerely

Chris Doyle
Environment Agency
Customer & Engagement, Wessex Area
Rivers House, East Quay, Bridgwater, Somerset, TA6 4YS
Wessex Team: 02030 250376
Email: wessexenquiries@environment-agency.gov.uk

Creating a better place for people and wildlife

Appendix 3b

Subject: 205009-WX: [201841-WX]: Waterbodies

From: Wessex Enquiries <WessexEnquiries@environment-agency.gov.uk>
To: Frank Cox f.cox@portland-port.co.uk
Date: 18/02/2021

Thank you for your enquiry, which we received on 10 February 2021

RE: Request for information under the Freedom of Information Act 2000 (FOIA) / Environmental Information Regulations 2004 (EIR)

Biota modelling process
We have a limited number of biota monitoring locations and therefore can only directly assess a limited number of WBs. For some ubiquitous, persistent, bio-accumulative and toxic (uPBTs) substances our evidence shows they are present everywhere or nearly everywhere that we sample.

Determining chemical classification solely based on direct assessment of monitoring locations would therefore significantly under-estimate the scale of the challenge for these substances, so we have devised an approach which makes best use of all available evidence.
A simple modelling approach was developed which uses any biota data collected within a spatial area (in this case the OSPAR Regional Seas Eastern Channel area), identifies the median value and "models" the value as a surrogate to all the water bodies within that area.

Biota modelling is only used where we don't have any other assessment results based on biota data.

Portland Query
All these waterbodies have been assessed using surrogate biota data from the wider Eastern Channel sea area as no local monitored data is available.

1. Portland (GB680805270000)
2. Fleet Lagoon (GB510080077000)
3. Dorset/ Hampshire (GB620705550000)
4. Weymouth bay (GB680805070000)

Hexachlorobenzene (HCB), Hexachlorobutadiene (HCBD), Hexabromocyclododecane (HBCDD), Perfluorooctylsulphonate anion (PFOS), Polybrominated diphenyl ethers (PDBEs) and Mercury classification was assessed using Saline fish biota data from these sites:

SAMPLE POINT	SMPT_SHORT_NAME	EASTING	NORTHING
F0010080	SUSSEX EAST GENERIC WB BENTHIC SITE	583000	108200
F0017528	SUSSEX GENERIC WFD WB BENTHIC SITE	523100	103500
70710016	DART WFD FISH WATER COLUMN DATA	285119	56182

Benzo(a)pyrene, Fluoranthene and Dioxins were assessed using Blue Mussel biota data from these sites:

WATERBODY_ID	WATERBODY_NAME	SMPT	SMPT_NAME	EASTING	NORTHING
GB520704202800	SOUTHAMPTON WATER	G0003552	WOOLSTON MUSSEL TISSUE	444000	109800
GB580705130000	LANGSTONE HARBOUR	G0006529	LANGSTONE HARBOUR CSEMP MUSSELS	468078	101501
GB510804505600	EXE	70510023	EXE ESTUARY AT STARCROSS SHELLFISH	297830	81460

I hope that we have correctly interpreted your request. Please refer to the Open Government Licence which explains the permitted use of this information.

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

If you are not satisfied with our response to your request for information you can contact us within two calendar months to ask for our decision to be reviewed.

Yours sincerely

Chris Doyle
Environment Agency
Customer & Engagement, Wessex Area
Rivers House, East Quay, Bridgwater, Somerset, TA6 4YS
Wessex Team: 02030 250376
Email: wessexenquiries@environment-agency.gov.uk

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Appendices Chapters 7-10

None apply