Tees Maintenance Dredging Annual Review 2018

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Royal HaskoningDHV
Enhancing Society Together

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1 Introduction

1.1 Rationale

The purpose of this document is to provide an annual review of any changes to PD Teesport's (PDT) existing maintenance dredging practices and any changes to the existing environment within the Tees estuary, set against a known baseline.

The original Baseline Document was produced in 2005 (ABPmer, 2005). Royal Haskoning subsequently produced an updated Baseline Document in February 2008 (Royal Haskoning, 2008). which incorporated information which is relevant to the integrity of the European and Ramsar sites in the Tees estuary. Annual reviews and updates to the 2008 Baseline Document have been undertaken during:

- November 2009 (Royal Haskoning, 2009).
- February 2011 (Royal Haskoning, 2012a).
- March 2012 (Royal Haskoning, 2012b).
- February 2013 (Royal HaskoningDHV, 2013).
- May 2014 (Royal HaskoningDHV, 2014).
- February 2015 (Royal HaskoningDHV, 2015a).
- January 2016 (Royal HaskoningDHV, 2016).
- September 2017 (Royal HaskoningDHV, 2017).
- August 2018 (Royal HaskoningDHV, 2018).

It should be noted that the annual updates are on the reviews themselves, rather than the initial Baseline Document. The main headings of the review are self-explanatory; however, the sub-headings are intended to cover the various aspects of the Baseline Document that could potentially change. Any changes to conclusions and recommendations provided within the last annual update (as a result of any new information) are also presented.

1.2 Background

Maintenance Dredging and the Habitats Regulations 1994, A Conservation Assessment Protocol for England (referred to as 'the Protocol' hereafter) was published by the Department for Environment, Food and Rural Affairs (Defra) in 2007 and followed the draft Protocol issued in 2003 for pilot studies at three trial sites on the Humber, Medina and Fal/Helford. The protocol set out an approach for operators and regulators to provide a 'Maintenance Dredge Protocol (MDP) Baseline Document' to present existing and readily available information to describe the current and historical patterns of dredging in relation to the conservation objectives of a European site.

Where maintenance dredging is found likely to have, or be having, a significant effect on a European or Ramsar site, a port authorising or undertaking licensed, contracted or otherwise permitted maintenance dredging operations (including disposal) must exercise their functions in compliance with the requirements of the EC Habitats Directive (92/43/EEC) on the conservation of on the conservation of natural habitats and of wild flora and fauna (the Habitats Directive). The Protocol provides assistance to operators and regulators seeking, or giving, approval for maintenance dredging activities that could potentially affect European and Ramsar sites. Following this process enables issues associated with the Habitats Directive to be dealt with in a streamlined and proportionate manner, assisting harbour and port authorities in fulfilling their statutory obligations, and minimising the delay and cost to port and marine operators in obtaining consents.

The presumption in assessing any potential consequences of dredging activity is that maintenance dredging will continue in line with the established practice (described herein). The Baseline Document also presumes that existing practice is part of the functioning of the existing system.

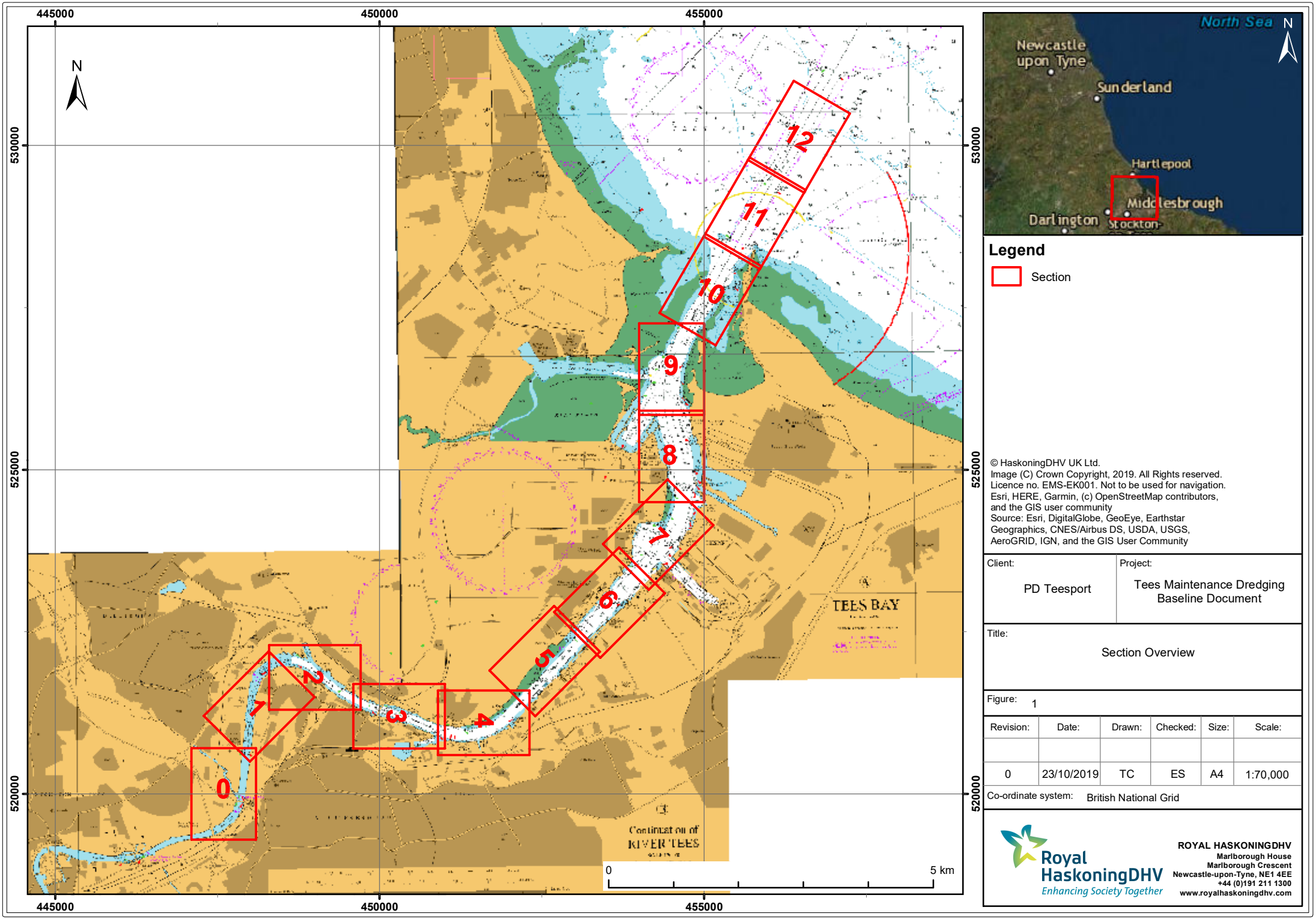
PDT has commissioned Royal HaskoningDHV to undertake a review of the 2017 MDP Baseline Document (Royal HaskoningDHV, 2018) in order to assess the effects of maintenance dredging on European and Ramsar sites in the vicinity of the Tees estuary and to determine that they remain in compliance with the Habitats Directive. The findings of the review are presented in this report.

The requirements of the Water Framework Directive (2000/60/EC) (WFD) extend further than the Habitats Directive, to consider the entire aquatic environment, rather than specific designated sites. However, aiming to achieve Good Ecological Potential / Status, which is required under the WFD, is also a key requirement for maintaining the designated sites in favourable condition; hence the requirements of the two Directives overlap.

A WFD compliance assessment was undertaken as part of the 2017 MDP Baseline Document update and, therefore, an additional assessment will not be repeated. However, a review of the previous WFD assessment has been undertaken as part of the 2018 update, considering the findings of the 2018 and 2019 sediment quality analysis, and the latest maintenance dredge and disposal information from 2018, to ensure the assessment remains valid.

1.3 Study area

The study area is defined as the area within which maintenance dredging is undertaken by PDT; that is, the area commencing 185m down-estuary of the Tees Barrage at Blue House Point to the seaward limit of the Port Authority Area. This area effectively includes all river frontage and facilities within the estuary commencing near the Tees Barrage (see Figure 1). The port facilities within Hartlepool Bay are also included in the study area. As shown on Figure 1, the study area is subdivided into 13 sectors (Sector 0 to 12).



Legend

Section

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Client:	Project:
PD Teesport	Tees Maintenance Dredging Baseline Document

Title: Section Overview

Figure: 1

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2 Existing maintenance dredging regime

PDT has a statutory duty to maintain navigation within the Tees estuary and into the Hartlepool docks. As part of this responsibility, PDT must maintain the advertised dredge depths within the defined areas (hereafter referred to as “the maintained areas”). In order to achieve this, PDT carries out maintenance dredging in the reaches of the river shown in Figure 1.

Previously, maintenance dredging was undertaken within the study area by Hartlepool Marina. This equated to approximately 10,000m^3 per annum, however this was not undertaken regularly. Consultation with PDT has identified that there is no longer a marine licence in place allowing Hartlepool Marina to undertake maintenance dredging and, therefore, no dredging was undertaken within the marina during 2018.

2.1 Dredge and disposal methods

Most dredging occurs in the approach channel and low-middle estuary in order to maintain access to berth pockets and impounded docks. Trailing Suction Hopper Dredgers (TSHD) are currently used for the majority of the dredging and are supported by ploughing where required. PDT employs two TSHDs of 1,500m^3 hopper volume to maintain depths within the navigable channel and berths within the Tees estuary and Hartlepool. Both dredgers have active bottom door offloading systems.

PDT also currently operates its own 5m plough dredge (deployed via the buoy tender ‘Wilton’) to supplement ongoing suction dredging operations through the removal of isolated high spots on the riverbed, primarily in frontages or confined areas. This plough is supplemented with a 10m plough chartered in to support the dredge operations. Plough dredging may also be utilised to move recently deposited accumulations of sediment to adjacent scour spots within the river, thus maintaining sediment within the estuarine system and reducing the overall volumes of dredgings requiring disposal to sea. PDT previously used contracted-in vessels approximately six times per year, however a new vessel was purchased and a 11m plough was installed in 2017 meaning in-contracted vessels are no longer required for maintenance dredging. .

PDT operates its vessels under the requirements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (the ‘ISM’ code) which is then externally audited by the Maritime and Coastguard Agency. PDT’s operational activities are undertaken in compliance with an Environmental Management System (EMS) meeting ISO14001 requirements and the PD Ports Group Environmental Policy Statement (provided below).

Dredging practices have remained unchanged during the period 2005 to 2018.

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PD PORTS

GROUP ENVIRONMENTAL POLICY STATEMENT

PD Ports is an established ports and logistics business offering marine and port operations, warehousing, transport, forwarding and chartering throughout the UK.
We recognise environmental protection as one of our guiding principles and a key component of sound business performance; as such we have made the following commitments.

We will:

- Maintain our certification to ISO 14001 and operate as a minimum in compliance with all relevant legal requirements applicable to our business.
- Incorporate the consideration of potential environmental issues into our decision making and operations, including purchasing activities.
- Train, educate and inform our employees about environmental issues that may affect their work and promote environmental awareness to all those working on our sites.
- Ensure there are adequately trained personnel and suitable equipment available to respond immediately to any environmental / pollution incident and to regularly exercise contingency plans.
- Promote efficient use of resources and reduction of waste throughout our operations including electricity, fuel, raw materials, water and other resources, particularly those that are non-renewable, thereby reducing our carbon footprint.
- Work with our customers and suppliers to assess opportunities for the use of renewable and alternative energy sources.
- When dealing with any substances especially hazardous substances take all reasonable steps to prevent pollution during handling, transportation, storage and disposal, including developing procedures for dealing with emergencies and spill response in consultation with our neighbours and tenants as appropriate.
- To plan for changing environmental conditions through, amongst other measures, the development of a Climate Change Mitigation and Adaption Plan.
- Aim and work to minimise the impact of our activities on the local community and communicate proactively on the environment with interested parties, including customers, tenants, local residents and public authorities.
- Aim and work to minimise our impact on the ecology and the surrounding environment through the terrestrial and marine planning process.
- Undertake and regulate marine movements to minimise the impact on the surrounding environment and on other stakeholders
- Strive to continually improve our environmental performance by periodically reviewing our environmental objectives and targets in the light of new legislation and future plans.

Signature:

[redacted] PD Ports, Jan 2018

Issue: Final – Revision 2

Date: 16th July 2014 (DJ)

Revised: April 2017 (DJ)

STRETCH

2.2 Dredge volumes

A summary of dredged volumes (m^3) by each reach from 2001 to 2018 is provided in Table 1. Data on dredging was obtained from PDT and extends the time series presented in Royal Haskoning (2008) from 2005 to 2018. As with previous years, no dredging has occurred in Reach 0 (Figure 1, and Figure A in Appendix 1) during the reporting period.

2.3 Disposal volumes

Table 1 and Figure 2 provides a summary of the total volume of dredged material (m^3) disposed of to the Tees Bay offshore disposal site, from each reach of the river shown in Figures A to M in Appendix 1. Other areas including Tees Berths, Hartlepool and the Seaton Channel are also shown in Table 1. The total volume of maintenance dredged material disposal has decreased from 0.71 million m^3 in 2017 to 0.62 million m^3 in 2018 This is less than the average annual volume of maintenance dredged material disposal from the period 2001 to 2018, which equates to approximately 1.1 million m^3 per annum. Contributing factors to the reduction in volume of material requiring disposal offshore during 2018 are weather conditions and varied deposition rates within maintained areas.

Table 1 Summary of the total volumes of dredged material disposal (m^3) from each reach of the River Tees (and Hartlepool) from 2001 to 2018

Reach	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	5,911	127,827	42,384	70,856	12,361	27,075	42,701	49,701	24,159	40,237	19,066	73,544	25,674	48,268	62,094	1,500	33,972	2,165
2	21,768	122,381	16,470	73,210	11,649	12,982	26,028	19,805	60,118	32,817	371	9,814	8,863	15,894	29,830	61,722	25,133	22,508
3	0	1,366	4,176	3,205	412	412	1,925	735	1,772	48,532	0	37,429	0	52,857	64,998	65,468	33,698	8,501
4	3,131	1,666	127	4,468	676	282	1,514	0	274	6,056	11,386	1,500	2,996	12,504	11,770	12,884	8,771	1,879
5	4,621	1,634	2,751	3,815	5,997	1,339	764	0	1,336	4,745	13,496	2,541	15,018	5,370	471	951	0	0
6	1,625	5,282	24,645	4,859	23,640	12,092	3,088	18,906	7,037	17,009	41,303	21,755	26,210	3,630	10,534	18,383	8,242	8,624
7	51,303	4,804	10,765	3,297	1,243	2,642	9,841	55,084	19,322	43,157	12,502	10,160	19,746	42,200	61,866	25,041	3,339	0
8	37,075	76,297	72,261	39,251	30,172	56,926	96,160	82,531	140,839	68,357	27,102	64,468	131,948	93,188	111,145	37,485	50,317	44,138
9	256,158	252,715	279,054	330,835	321,316	347,365	332,679	349,982	174,009	266,187	336,050	278,883	286,441	124,821	230,316	143,677	202,051	121,796
10	174,248	118,613	171,950	137,022	161,349	168,733	143,089	178,819	186,336	317,961	117,635	211,799	221,176	201,953	106,326	51,239	44,053	36,072
11	112,437	296,471	85,385	121,807	113,304	230,099	97,682	92,427	163,910	225,143	159,529	110,787	43,032	110,777	36,893	64,146	44,546	129,283
12	34,747	28,437	28,156	48,707	21,307	28,262	39,441	23,548	27,937	12,133	38,877	35,415	7,662	5,954	4898	11,168	4,796	4,471
Tees berths	148,837	115,219	141,880	303,869	164,664	316,696	254,458	272,520	215,702	162,053	195,482	159,067	205,141	246,486	141,160	173,396	111,221	92,351
Hartlepool	119,847	157,329	146,457	114,104	89,811	137,606	121,605	132,041	125,032	170,170	154,025	80,410	186,229	99,068	79,818	92,781	79,936	110,448
Seaton Channel	0	10,900	0	0	0	0	22,279	102,463	111,424	42,110	21,060	0	49,598	74,652	0	0	71,803	41,712
Other	0	245	9,809	0	0	312	23,366	34,605	54,610	46,725	461	0	0	0	23,972	58,842	0	53,880
Total (x 10^6)	**0.972**	**1.321**	**1.036**	**1.259**	**0.958**	**1.343**	**1.217**	**1.413**	**1.314**	**1.503**	**1.148**	**1.098**	**1.230**	**1.13**	**0.97**	**0.81**	**0.71**	**0.62**

2.3.1 Dredge depths

The present main channel has declared depths of 15.4m below Chart Datum (CD) in the approach channel (i.e. in Tees Bay), 14.1m below CD to upstream of Redcar Ore Terminal, 10.4m below CD up to Teesport and then progressively less depth up to 4.5m below CD (bCD) in Billingham Reach. Parts of the channel now declared at 14.1m below CD were originally dredged to a deeper depth. The declared depth of berths and docks varies depending on the location and the vessels which require access.

The approach channel to Hartlepool Docks is currently maintained to 5.7m bCD. Victoria Dock is maintained to 6.8m bCD and the deep water berths within the docks are maintained to 9.5m bCD. The berth pocket within Tees Dock has been dredged to a depth of 14.5m bCD, with the general dock area dredged to 10.9m bCD. Declared depths are required for navigational purposes, however actual dredge depths may be commonly up to 0.5m greater in depth given the tolerances associated with dredging practices.

It should be noted that PDT is proposing to deepen the Tees navigation channel and turning circle to a maximum depth of 14.5m bCD for the Northern Gateway Container Terminal (NGCT) project (detailed further in Section 5.1), as well as deepen, widen and realign the approach channel to Hartlepool Docks to a depth of 7.5m bCD (Section 5.4).

3 Existing disposal strategy

3.1 Disposal protocol

The volume of dredged material requiring disposal from maintenance dredging operations must be recorded and provided to the Marine Management Organisation (MMO) and Cefas as a condition of the marine licence (L/2015/00427/4). It is often recommended that a disposal protocol be developed to manage this process. However, it is the intention that this document adequately addresses the requirement of any such protocol and, as such, PDT has not developed a separate protocol for this purpose. All relevant information regarding disposal procedures and practices (including any beneficial uses) is provided in the following sections.

3.2 Disposal locations and quantities

No changes have occurred to the location of the offshore disposal sites during the reporting period. The active disposal sites present in Tees Bay are summarised in Table 2. In general, Tees Bay A (TY160) is used for the disposal of maintenance dredge arisings while Tees Bay C (TY150) is used for capital dredge arisings (Figure 3). Tees Bay B (TY110) and Tees Bay Foreshore (TY170) are closed.

Table 2 Active disposal sites present in Tees Bay

Disposal site	Status	Description	Comment
Tees Bay A (TY160) Within the area bounded by joining the points: 54 40.800 N 01 03.500 W 54 41.500 N 01 02.200 W 54 41.000 N 01 00.300 W 54 40.200 N 01 01.500 W 54 40.800 N 01 03.500 W	Active	Active site for soft non-cohesive maintenance material	DEFRA records show volume fluctuating from 0.3 million to 2.4 million wet tonnes over a 15 year period. Volumes drop off post 1996. Largest volume deposited since 1996 was 1.8 million wet tonnes.
Tees Bay C (TY150) Within the area bounded by joining the points: 54 42.600N 00 58.600W 54 41.900N 00 57.400W 54 41.400N 00 58.700W 54 42.300N 00 59.900W 54 42.600N 00 58.600W	Active	Predominantly used for capital dredged material. Some maintenance dredging has been disposed of at this site.	DEFRA records show small scale usage. Peak volume deposited was 1.9 million wet tonnes in 1999, associated with the construction of the downstream Ro-Ro berths. Typical annual volume is 0.1 million wet tonnes. Some years show no usage at all.

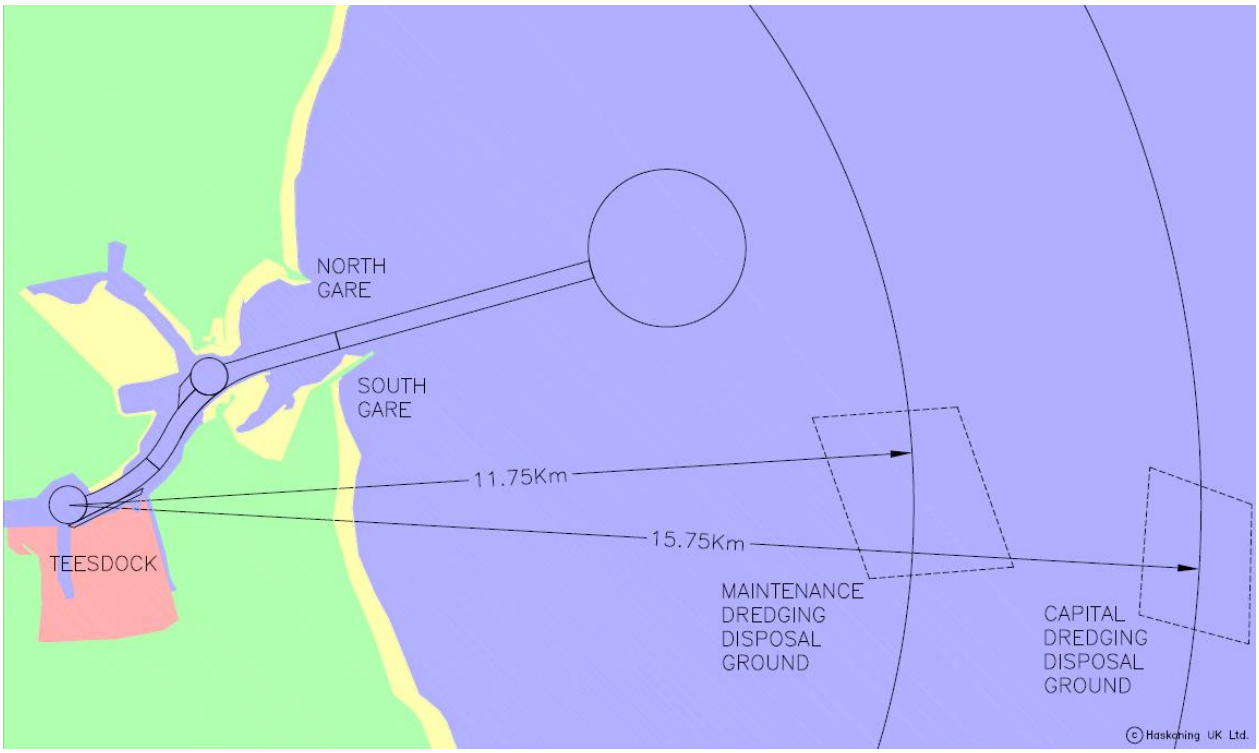


Figure 2 The location of dredging disposal grounds TY160 (maintenance material) and TY150 (capital material) and their distance (km) offshore from Tees Dock

3.3 Beneficial use of dredged material

Where suitable, a proportion of dredged arisings are proposed for alternative (beneficial) use within the estuary (alternative use considerations are a legal requirement of the marine licensing process for disposal of dredged material under the Waste Framework Directive). Areas of potential interest for beneficial use include the North Tees mudflat; regeneration of the mudflat using dredged material could be considered at this location if it becomes evident that accretion of the mudflat is not occurring following reinstatement of the half-tide embankment in 2010 (no requirement for use of material at this location is currently evident).

The use of geo-textiles is also being considered for the construction of 'bird islands' at Bran Sands, to replace those lost over the past few years. Such proposals are still being investigated at a high-level and would be subject to consultation and regulatory approval prior to implementation.

The Sirius Minerals Harbour facilities scheme includes a number of habitat enhancement measures within Bran Sands lagoon, designed to provide shallow water areas with intertidal fringes. The creation of this habitat would involve the placement of uncontaminated fine sediment (i.e. silt) from normal maintenance dredging operations on top of sands and gravels from capital dredging undertaken as part of the Sirius Minerals Harbour facilities scheme. This Baseline Document will be updated to reflect the actual works which are undertaken following progression of the construction works.

A 'Mitigation and Beneficial Use' plan is being developed by PDT in conjunction with Natural England to consider and incorporate these and other potential beneficial uses within the estuary. Beneficial use and mitigation will be part of the Tees Estuary Partnership's remit which is addressing these items on a port wide basis. There is the potential for the development of a 'habitat banking system' to be developed, which would identify possible mitigation or beneficial use options within and around the Tees estuary, which developers could adopt (if required) to offset habitat loss. The enhancements may be funded through capital project

mitigation/compensation but any provision of silts which these schemes may require could be supplied on the maintenance consent volumes. This Baseline Document will be updated to reflect the findings of these discussions as and when they are available.

The Tees River Trust (TRT) are considering potential habitat improvement opportunities to areas of currently degraded intertidal in the Newport Bridge area of the Tees. Specifically, the TRT is hoping to develop a habitat banking system that would enable various developers to utilise areas of habitat around Newport Bridge. There may be an opportunity for PDT to contribute towards such works through the provision of maintenance dredged material. This Baseline Document will be updated in the future to reflect any progress on these habitat improvement opportunities.

3.4 Mechanism of disposal

The mechanism for disposal during the reporting period has been for the dredger to steam out to Tees Bay A (TY160) and to release the dredged arisings over the disposal site via bottom door release (capital arisings from operations on the Tees are disposed of via a split hopper into site TY150).

Tees Bay A comprises 12 areas, as shown on Figure 4. These areas each receive dredged material during a certain month of the year, with the volume of disposed material varying during each month. PDT has undertaken bathymetric surveys which demonstrate the success of the managed disposal within each of the 12 areas. The current plan will be retained without changing areas and once CEFAS has carried out its survey of the area (e.g. for contamination), PDT may act on that data and amend the disposal plan.

Table 3 reports the average monthly disposal quantities from 2006 to 2018 and shows that the disposal of material is distributed throughout the disposal site, thus avoiding mounding of material at one location within the disposal site boundary.

Table 3 Average disposal quantity per month from 2006 to 2018

Month	Disposal quantity (m^3)	Month	Disposal quantity (m^3)
January	118,538	July	90306
February	198,665	August	144231
March	128,727	September	96523
April	100,559	October	76871
May	109,540	November	79449
June	105,991	December	80911

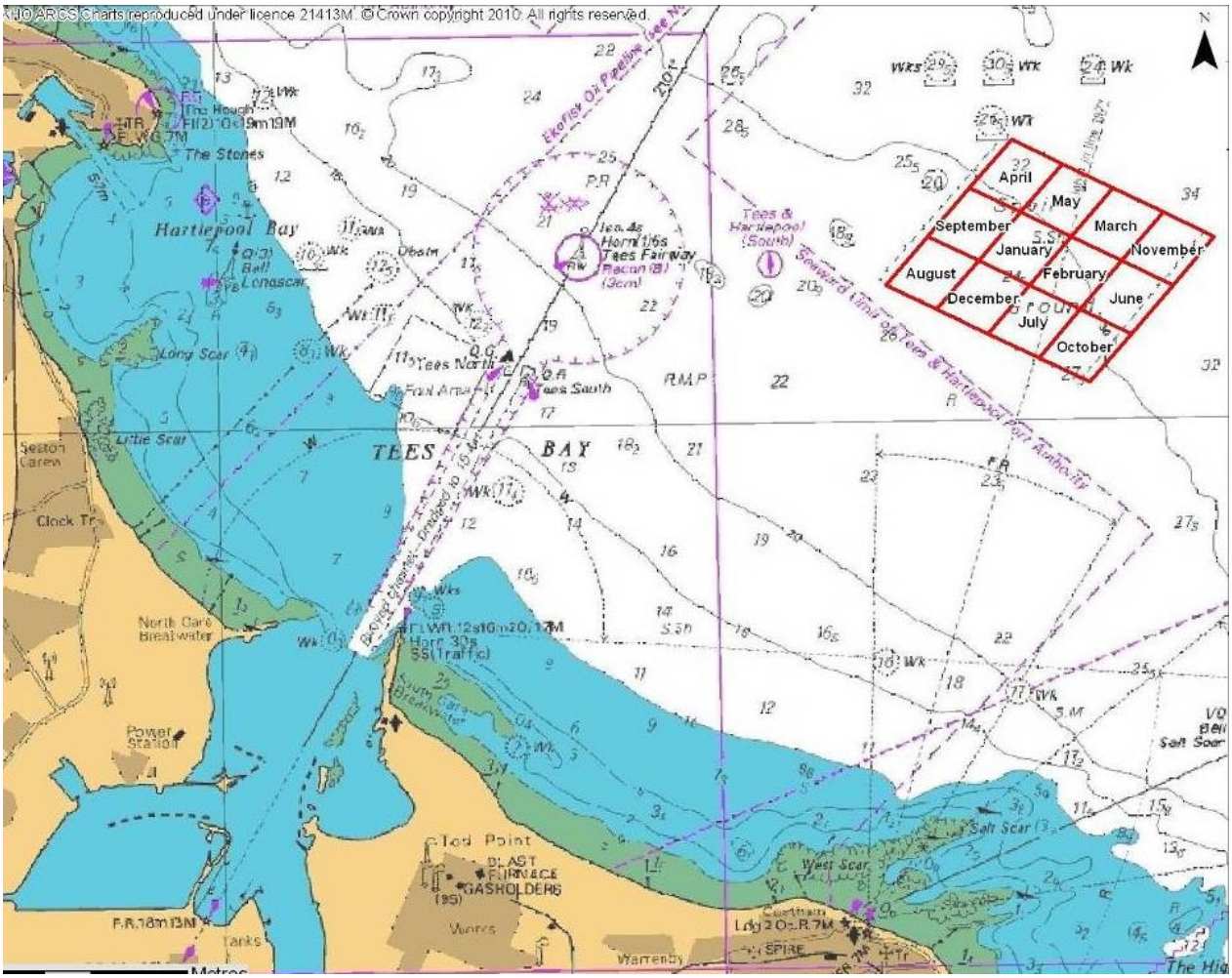


Figure 3 Tees Bay A maintenance dredging disposal ground identifying disposal location by month

4 Consents and licences

4.1 Marine Licences

Part 4 of the Marine and Coastal Access Act 2009 (MCAA) provides a framework for the licensing of activities below the level of Mean High Water Spring (MHWS) tides. The 'marine licensing' system has been in force since 6 April 2011. The MMO is the regulator for marine licensing in English inshore and offshore waters.

Since the Baseline Document was first produced, a number of licences have been issued under the marine licensing system and its predecessors (most notably with regard to this document is the 10 year marine licence held by PDT for the disposal to sea of maintenance dredging (L/2015/00427/4).

Marine licences which have been issued post-production of the Baseline Document are outlined below. The licences have been split into projects which have been completed, and those which are currently uncompleted or have not started.

4.1.1 Completed projects

The following projects are considered complete as the licence end date has expired. If any aspects of the project works were not complete, a new licence would be required as an extension of a marine licence is not acceptable by the MMO if the licence is expired.

- Licence 33195/06/0 granted 05/09/06 – 04/09/08 for 19,800 tonnes (Dawson`s North Sea Supply Base (completed 2009) and Teesside Cast Products (TCP) Heavy Lift Quay (completed 2008)). An application was submitted in 2011 to dredge to 8.5m below CD. This development is now complete with limited dredge works remaining.

- Licence 32880/06/01 granted 14/09/06 – 14/04/09 for 88,000 tonnes (Billingham Reach Wharf, Tees Dock Turning Circle, Tees Dock Water Area and Corporation Dock). This operation is now complete.

- Licence 32717/08/0 granted 21/05/2008 – 20/05/2009 for the disposal of up to 1,934,836 tonnes of capital dredgings from Seaton Channel, the Holding Basin and Quays 10/11 of the Able (UK) yard was made by Able (UK) Ltd. on 2 December 2004. The licence was approved in May 2008 for disposal at Tees Bay A (TY160) and Seaton Channel was dredged in October 2010.

- Licence 34371/10/0 granted 4 June 2010 for works commencing between 5 June 2010 and 31 October 2010 for the reconstruction of an approximately 150m length of half tide embankment in the River Tees. The reconstruction used 45m long sections of geotube filled with suitable dredged material. This work was completed in November 2010.

- Licence L/2011/00052/3 granted 1 June 2011 for works commencing between 1 June 2011 and 30 September 2012 for the disposal of dredged material (licensed quantity of 2,804,000 tonnes) from River Tees Channel, Berths and Frontages; Hartlepool Channel and docks and water area; and Seaton Channel basin and berths. The approved disposal site is Tees Bay A (TY160). This operation is now complete.

- Licence L/2011/00335/1 granted 21 December 2011 for works commencing between 1 January 2012 and 31 March 2013 for the placement of a rock mattress to support the spud legs from jack-up barges as part of the loading facilities for offshore wind construction in Hartlepool Docks. This work has been completed.

- Licence L/2014/00014 granted 29 January 2014 for works commencing between 1 April 2014 and 31 October 2014 to undertake refurbishment works to an existing jetty at Simon Storage. No dredging was required as part of the scheme. The work commenced and was completed during 2014.

- Licence L/2013/00217 granted 10 July 2013 for works commencing between 10 July 2013 and 31 March 2018 to undertake capital dredging and construction to improve the Tees Dock No.1 Quay. Work started in April 2014 and has been completed.

- The MMO approved a variation request to licence L/2013/00217 on 26 January 2017(L/2013/00217/7), for the dredging and disposal of an additional 15,000m^3 (33,000 wet tonnes) of material from within Tees Dock. The additional material to be removed is clay (geological material). As with the previous versions of the licence, the material will be disposed of within Tees Bay. This version of the licence supersedes all earlier version of this licence. The work has been completed.

- Licence L/2014/00227 Completion of Replacement Quay dredging- The aim of the project was to deepen the quay to allow larger vessels to berth. The end date on the licence is 3rd August 2015

- Licence L/2012/00361/3 Tees Transporter Bridge Enhancements - Stockton and Middlesbrough Councils are proposing various works to turn the Tees Transporter Bridge into a sub-regional and national visitor centre and tourist attraction. The application covers installation of permanent piles and pile cap. The end date of the licence is 31st December 2014.

- Licence L/2017/00066 Port Clarence Erosion Protection Works, Environment Agency. This project is needed to stabilise a river bank at Port Clarence, which has become subjected to erosion. This project is required to ensure the effectiveness of the recent flood protection scheme that was constructed at the site in 2015. The end date of the licence is 30th September 2017.

- Licence L/2017/00202 Middlehaven Dock Bridge Construction. Middlesbrough Council applied for a licence to install a three-lane vehicular bridge to replace the pedestrian footbridge at Middlehaven Dock. The licence end date was 30th September 2018.

- Licence L/2013/00155 Able Middlesbrough Port Berth 1 & 2, Able UK Ltd. The licence was to return the depth to previous level from average 6.3 metres to 7 metres. The end date on the licence was 14th May 2016.

- Licence L/2015/00233/2 Teesside Renewables Energy Plant – Surface Water Outfall, ECO2 Ltd As part of the Teesside Renewable Energy Plant at Port Clarence, Teesside, a new drainage outfall to the River Tees is required. The end date on the licence was 9th January 2016.

- Licence L/2017/00259 Installation of two piles and a pontoon at Normanby Wharf, Dockside Road Middlesbrough. The end date of the licence is 30th September 2019.

- Licence L/2017/00395 Sabic Dolphin Walkways 3 and 5 Maintenance of existing work, Sabic UK Petrochemicals Ltd. Dolphin structures 3 and 7 (at SABIC North Tees facility) require repair and general remediation. This will include the replacement of a gangway and the sleeving of 3 piles together with general maintenance. The licence end date is 19th October 2018.

- Licence L/2017/00395 Sabic Dolphin Walkways 3 and 7, Sabic UK Petrochemicals Ltd. Repair and general remediation of dolphin structures 3 and 7. Licence end date 19th October 2018.

- Licence L/2017/00194 Demolition and Site clearance of No 1 Jetty at Sabic Petrochemicals UK, North Tees Site, Sabic UK Petrochemicals Ltd. Demolition of SABIC North Tees No. 1 Jetty 1, which is no longer required for operational use at SABIC Quay. Licence end date is 31 December 2017.

- Licence L/2014/00166/3 Dismantling, Demolition of Redundant No. 1 Jetty at Sabic Petrochemicals UK . Jetty 1 is no longer required in order to undertake operations at SABIC quay, therefore this licence is for demolition of Jetty 1. The Licence end date is 31st August 2016.

- Licence L/2018/00179 North Tees Jetty 1A Replacement Ethylene Loading Arm Maintenance of existing works, Sabic Global ltd. The licence end date is 24th April 2019.

- Licence L/2013/00332/1 North Tees Site Jetty 2 embankment repair, Sabic UK Petrochemicals Ltd. The intention of this project is to arrest the decay of the embankment around the loading jetty and partially reprofile it. The licence end date is 14th December 2013.

- Licence L/2012/00094/1 – SABIC Quay Marine Licence Application Jetty 3, Sabic UK Petrochemicals Ltd. Maintenance of two jetties at SABIC Quay and demolishment of Jetty 1. The licence end date is 29th March 2013.

- Licence L/2015/00226 – Sabic Works at No.3 Jett North Tees, Sabic UK Petrochemicals Ltd. Works include upgraded fire protection system, dismantling and removal of jetty control buildings and construction of jetty impounding basin. The licence end date it 30th September 2016.

- Licence L/2013/00172/1 Tees Overhead Line Removal, National Grid Electricity Transmission PLC. The licence is for removal of the existing overhead line as a new line is required. The licence end date is 31st July 2016.

- Licence L/2013/00082 Environment Agency Intertidal Grab Sampling for Benthic Inverts and Contaminant, Environment Agency. A survey to assess the ecological status of the marine environment under the Water Framework Directive. The licence end date is 7th March 2014.

- Licence L/2013/00217 for the installation of a 30m floating pontoon to the newly refurbished Tees Dock No.1 Quay. The MMO approved a variation request to licence L/2013/00217 on 28 March 2018 (L/2013/00217/8), The MMO also granted permission to extend the expiry date of the licence from 31 March 2018 to 1 September 2018, to allow the pontoon installation works to take place.

- Licences 34376/09/0 and 34377/09/0 were both granted on 26 October 2009 for works commencing no sooner than 1 January 2010 to the end of the day of 31 December 2013, for deposits in the sea in connection with marine construction works associated with the proposed QEII berth development; and for the deposit of 42,000 tonnes (21,000m³) of capital dredged material (Mercia Mudstone constituent only) from the QEII berth, at disposal site Tees Bay C (TY150). A variation to extend both licences was requested on 20 November 2013, which was issued on 31 December 2013, and therefore licence L/2013/00403 now supersedes Licence 34376/09/0; and Licence L/2013/00404 now supersedes Licence 34377/09/0. Both licences have an end date of 31 December 2016. A subsequent change was then required to transfer the licence holder from PDT to MGT Teesside Limited. These varied licences were issued on 24 December 2014 (L/2013/00403/3 and L/2013/00404/3) (with an expiry date of 31 December 2016). Licence L/2013/00404/5 was granted on 27 May 2015 and expired on 31 December 2018.

- Licence 34963/11/0 granted 28 January 2011 for works commencing between 28 January 2011 and 27 January 2012 for the disposal of dredged material (licensed quantity of 3,496 tonnes) from South Bank, Wharves (TATA) on the River Tees. The approved disposal site is Tees Bay A (TY160). This work has not commenced.

4.1.2 Extant marine licences

The following marine licences are for works that are either incomplete or which have not yet started:

- Licence L/2012/00366 granted 28 September 2012 for works commencing between 1 October 2012 and 31 May 2015 for the disposal of dredged material (licensed quantity 2,889,700 tonnes) from River Tees Channel, Berths and Frontages; Hartlepool Channel and docks and water area; and Seaton Channel basin and berths. The approved disposal site is Tees Bay A (TY160). This marine licence has now been superseded by Licence L2015/00427/1. Licence L2015/00427/1 was granted 30 December 2015 for maintenance dredging disposal. This is a 10 year licence commencing from 1 January 2016.

- A deemed marine licence was included within the Sirius Minerals Harbour Facilities Order 2016, issued by the Secretary of State. The Order permits Sirius Minerals to carry out construction of a new quay, capital dredging and disposal and enhancement works in Bran Sands lagoon.

- L/2019/00341 South Bank Wharf Site Investigation – Sampling, Able UK Ltd. Able is planning to develop a new and substantial port for the renewable energy sector. In order to inform the application for dredge works for the port, site investigation of soils are required including 23 boreholes. The licence end date is 31st December 2019. A marine licence has yet to be submitted for the development; however, an EIA scoping opinion has been received from the MMO and an ES is required (EIA/201900017 – South Bank Wharf Development, Able UK Ltd).

- L/2012/00116 Tees Crossing Overhead Power Line Scheme, National Grid Electricity Transmission PLC. The licence is for refurbishment the overhead line across the River Tees. A new overhead line route alignment was proposed. The licence end date is 15th April 2052.

- L/2019/00220 Inter Terminals – Jetty 1 upgrade, Inter Terminals Seal Sands Ltd. Top-side works to the existing infrastructure at Jetty 1 and Dolphin D, and a dredge of the river bed (with associated disposal of dredged material) to extend the existing berth pocket downstream. The licence end date is 31st December 2022.

- L/2017/00012/4 Able Seaton Port Berths, Holding Basin and Channel – Navigation dredging (capital). Licence to replace previous licence L/2012/00160/8 which resumed dredging continuing the licence L/201100110/5. Larger ships need to be able to access Able Seaton Port. Initially capital dredging will be undertaken in the Channel. Depths will be increased from -6m CD to -6.5m CD in order to receive the Shell Brent Delta module. The licence end date is 1 March 2026.

- L/2019/00328/1 Hartlepool approach channel. PDT has a marine licence to undertake a programme of works within and adjacent to the existing approach channel into Victoria Harbour, located to the immediate south of Hartlepool Headland. The consented works comprise capital dredging to deepen, realign, widen and extend the length of the existing approach channel, as well as the construction of an underwater retaining wall adjacent to Middleton Breakwater. The marine licence end date is 15th September 2026.

4.2 Harbour Revision Orders

4.2.1 The Teesport Harbour Revision Order 2008

PDT obtained a Harbour Revision Order (HRO) for the Northern Gateway Container Terminal (NGCT) in April 2008. The HRO, which came into force on 8 May 2008 for a period of 10 years, provided powers to dredge for the construction and maintenance of the NGCT development (see Section 4.1). A marine licence will be required for the construction works and the disposal of dredged material to offshore disposal sites.

PDT submitted an application to the MMO in January 2018 to extend the end date of the 2008 HRO for an addition 10 years. The MMO granted the extension and, therefore, the expiry date of the HRO is 7 May 2028.

5 Update on major proposed projects in the Tees estuary

This section updates the current status of the major consented and proposed projects in the maintained areas of the Tees estuary and Hartlepool. Detail regarding the marine licences for each project is included in Section 4.

5.1 Northern Gateway Container Terminal

In April 2008, PDT applied for and received an HRO and outline planning permission for the NGCT. The HRO gave PDT the power to dredge for the purposes of 'construction and maintaining the works and affording access to the works by vessels from time to time to deepen, dredge, scour, cleanse, alter and improve the river bed, shores and channels in the vicinity of NGCT operations'. The marine elements of the NGCT project have not yet been implemented, and a marine licence will be required from the MMO prior to commencement of such works. An EIA is being undertaken to support the marine licence application, which is expected to be submitted to the MMO in 2019.

The HRO expired on the 8th May 2018 (as the HRO was originally granted for a period of 10 years). PDT submitted an application to extend the expiry date of the HRO by an additional 10 years. The application was approved by the MMO in May 2018 and the expiry date of the HRO is now 7 May 2028.

Redcar and Cleveland Borough Council confirmed during December 2015 that development with regard to reference numbers R/2006/0433/OO, R/2012/0605/RM and R/2012/0764/RM (i.e. the reference numbers of planning permissions relating to NGCT) had formally commenced on site.

5.2 Sirius Minerals Harbour facilities

A DCO for the Sirius Minerals Harbour facilities was granted in 2016. The scheme, designed to export polyhalite bulk fertiliser, will comprise the following elements:

- A port terminal on the southern bank of the Tees estuary (with a quay and deepening (dredging) of a section of the approach channel and to create a berth pocket).
- A conveyor system to transfer product to the port terminal from a Materials Handling Facility (MHF) at Wilton.
- Product storage facilities (surge bins) adjacent to the quay and ship loaders on the quay.
- Staff welfare and office facilities.
- Habitat enhancement measures in Bran Sands lagoon.

The scheme is to be implemented in two phases, with an increased volume of product to be exported during Phase 2.

The dredging required for the scheme will generate silts, sands, gravels, clay and rock. Some of the (uncontaminated) sand and gravel from the capital dredging during Phase 1 of the scheme will be used within Bran Sands lagoon as part of the habitat enhancement proposals. This will comprise the placement of dredged material within the lagoon to raise the bed level and provide a feeding habitat for waterbirds. A proportion of the capital dredged clay and mudstone will be used to create a series of islands in the lagoon to provide nesting and roosting areas for waterbirds.

The Sirius Minerals Harbour facilities Environmental Statement (ES) (Royal HaskoningDHV, 2015b) states that average infill rates into the deepened areas (created due to dredging for the Sirius Minerals Harbour facilities scheme) are predicted to be up to 5,900m^3 per year. However, this would not represent an

additional 5,900m^3 of deposition a year (because there would be no effect on sediment transport into the estuary). The effect of the scheme will be a localised redistribution of (existing) sediment deposition, in response to predicted changes in current speeds. It is predicted that this very small change in the overall fine sediment regime will not alter the present frequency of, or methodology used for maintenance dredging and no effect on sediment supply to intertidal areas throughout the Tees estuary will occur.

The programme of works as presented within the DCO application stated that the minimum construction period for both Phase 1 and Phase 2 is 17 months. Phase 2 works are programmed to commence within six years of completion of Phase 1. Construction works for the Harbour facilities have not yet commenced and the commencement date is currently unknown.

5.3 Hartlepool approach channel

As noted above, PDT is proposing to undertake works to the Hartlepool approach channel, located to the immediate south of Hartlepool Headland. PDT is proposing to realign, widen, deepen and extend the length of the approach channel, to accommodate the needs of both the offshore wind industry and other existing customers. The proposed works will include the installation of an underwater retaining wall adjacent to Middleton Breakwater. PDT submitted a marine licence application in December 2018 and the licence was granted 3rd October 2019 (L/2019/00328/1). Works have not yet commenced on this project.

5.4 South Bank Wharf

ABLE UK Ltd are planning to develop a substantial new port for the renewable energy sector, specifically offshore wind farm developments. There is a requirement to bring the component parts of offshore wind farms manufactured at different locations to a construction port close to their offshore point of installation. The application site provides on optimal location for a number of offshore projects currently proposed in the North Sea. The use of the port will include heavy load operations and handling of the various elements that comprise an offshore wind turbine.

To enable vessel access to the operational quay and allow berthing alongside its length over a commercially viable tidal range, capital dredging will be required from three distinct areas:

- Berthing Pocket: The quay will have a dredged berthing pocket that will be maintained up to -12.5 mCD. The berthing pocket will be 70 m wide.
- Approach Channel: The existing river channel is dredged to -14.1mCD. From Norsea Oil Terminal (2.7km downstream) the dredged level reduces in steps to a minimum depth -5.7 mCD at the downstream end of the development site. The channel will be reduced to -12.5mCD from the Norsea Oil Terminal over approximately 3.5km in order to provide a maintained depth of -12mCD.
- Turning Area: A Turning Circle is located outside of Tees Dock. This is partly dredged to -10.4 mCD, and partly to -8.8 mCD. Due to the narrowness of the river at the new quay, vessels will need to utilise this facility and the shallow section will need to be deepened to -12.5 mCD and maintained at - 12.0mCD.

The proposed dredge area overlaps to a large extent with the area proposed to be dredged for the NGCT. The capital dredge for the project would be 2.5Mm^3 (gross) or 1.6 Mm^3 if carried in conjunction with the NGCT project.

As stated in Section 4.1.2 this project currently has no marine licence. An EIA Scoping Opinion was received from the MMO stating an EIA would be required in support of a marine licence application (EIA/2019/00017).

As the project is at an early stage and has not been consented, details could change or be refined and consent may not be granted. Therefore, it is currently unclear what the implications of the project would be on PDT's maintenance dredging. However, if consented this project would need to be reviewed in the next update to this report.

6 New environmental information

6.1 Designated sites

6.1.1 Teesmouth and Cleveland Coast SPA and Ramsar site

The Teesmouth and Cleveland Coast SPA includes a range of coastal habitats, including sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes. Together these habitats provide feeding and roosting opportunities for important numbers of waterbirds in winter and during passage periods. In summer, little tern *Sterna albifrons* breed on beaches within the SPA, while Sandwich tern *Sterna sandvicensis* occur on passage.

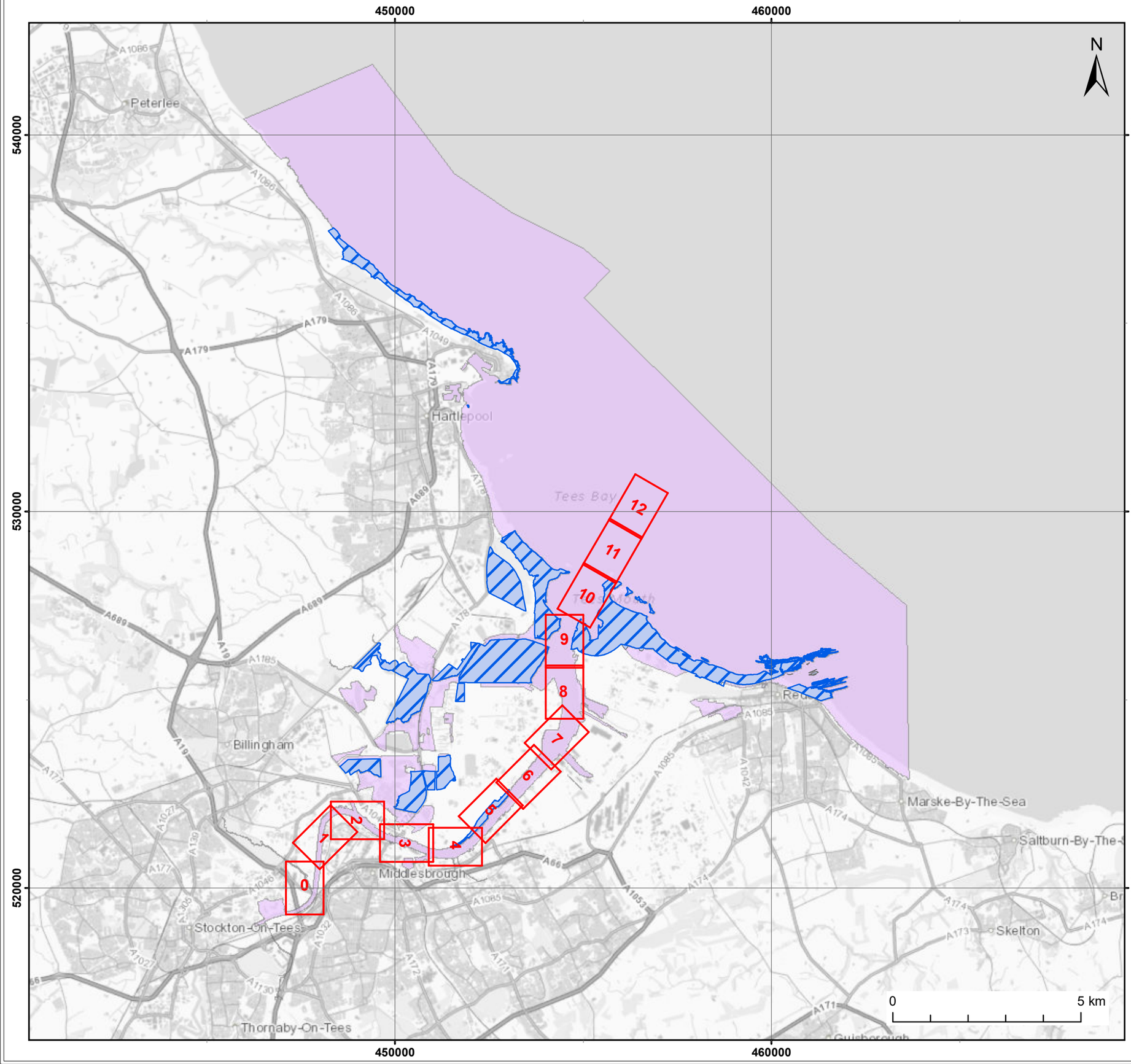
Proposed changes to the SPA and Ramsar site

Natural England has reviewed the suite of nature conservation designations in the Teesmouth and Cleveland Coast area, including the Teesmouth and Cleveland Coast SPA and Ramsar Site. Natural England recommended to Government that the existing SPA and Ramsar site be revised to include extensions and additional qualifying interests. Consultation on the proposals began in July 2018 and closed November 2018. Since the consultation, Natural England submitted its final advice to Defra for consideration. At the time of writing no further updates are available.

The existing Teesmouth and Cleveland Coast SPA is classified for breeding little tern, passage Sandwich tern, non-breeding red knot, passage common redshank and a non-breeding assemblage of over 20,000 waterbirds. An extension to the existing SPA has been proposed to protect the at sea foraging areas for little tern and common tern which breed at the existing coastal SPA. Additionally, the proposals include adding the at sea foraging areas for breeding common tern and little tern, as well as the addition of breeding avocet and non-breeding ruff as new features to the site. The designation also includes new additional wetland areas such as saltmarsh, wet grassland and intertidal areas which are important for other foraging and roosting waterbirds.

It is proposed that the existing Teesmouth and Cleveland Coast SPA boundary site is extended to cover an area from Castle Eden Denemouth in the north to Marske-by-the-Sea in the south, and includes the River Tees up to the Tees Barrage. The seaward boundary includes waters out to 3.5km from Crimdon Dene to include the areas of greatest importance to the little terns at that colony, and to around 6km offshore further south to include the areas of greatest importance to the common terns at the Saltholme colony. Additional terrestrial areas are included in the extension as they provide important habitat for the waterbird assemblage.

It is also proposed to extend the existing Teesmouth and Cleveland Coast Ramsar site boundary to include additional wetland areas. The Ramsar site will not extend outside of the pSPA extension and will only cover those terrestrial areas of the pSPA down to the mean low water. The location of the SPA and the pSPA extension is shown on Figure 4 below and a summary of the interest features of the site is provided in Table 4 below.



Legend

- Section
- Teesmouth and Cleveland Coast Special Protection Area (SPA)
- Teesmouth and Cleveland Coast Ramsar Site
- Teesmouth and Cleveland Coast Potential Special Protection Area Extension

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Client:	Project:
PD Teesport	Tees Maintenance Dredging Baseline Document

Title: Teesmouth and Cleveland Coast SPA and Ramsar and proposed extension

Figure: 4

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	23/10/2019	TC	ES	A3	1:100,000

Co-ordinate system: British National Grid

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Table 4 Summary of the interest features of the Teesmouth and Cleveland Coast pSPA and Ramsar site

Species	Population in GB (Natural England, 2018a)	Currently a feature of the existing SPA and Ramsar site (Natural England, 2018a)	pSPA population (Natural England, 2018a)	Usage of the pSPA and Ramsar site (Natural England, 2018a)
Annex 1 species				
Pied avocet *Recurvirostra avosetta*	Estimated to be 1,500 pairs, representing 6.2% of the West Europe and North-west Africa breeding population.	No – new qualifying feature	Between 2010 and 2014 the pSPA and Ramsar site supported an average of 18 breeding pairs, representing 1.2% of the GB population. The species does not qualifying as a Ramsar feature as it does not meet the 1% biogeographic threshold.	The majority of birds breed on Number 4 Brinefield, mainly on the saline lagoon south of Greatham Creek, with smaller numbers on Greenabella Marsh.
Ruff *Calidris pugnax*	The non-breeding population of ruff in GB is estimated at 800 individuals, representing about 0.05% to 0.08% of the Northern Europe and Western Siberia / West Africa population (1M to 1.5M individuals during 1950 to 2000).	No – new qualifying feature	Between 2011/12 and 2015/16 the pSPA, including proposed extensions, supported an average of 19 individuals which represents 2.4% of the GB non-breeding population.	Ruff occur at shallow waterbodies (inland reservoirs) across the site, in particular on the pools at RSPB Saltholme and North Tees Marshes.
Common tern *Sterna hirundo*	The breeding population of common terns in Great Britain is estimated to be 10,000 pairs, representing at least 15% of the Southern & Western European breeding population	No – new qualifying feature	Between 2010 and 2014 the pSPA, including the proposed extensions, supported an average of 399 breeding pairs of common terns, which represent about 4% of the GB breeding population.	Nesting birds are typically concentrated on islands within the various waterbodies at Saltholme (11km south of the proposed scheme at Hartlepool), with variable and smaller numbers of nests on the saline lagoon in No. 4 Brinefield south of Greatham Creek, and on rafts at Cowpen Marsh. Two pairs also bred on Portrack Marsh in 2014.
Sandwich tern *Thalasseus sandvicensis*	The passage population of Sandwich terns in Great Britain is estimated to be 44,300 individuals, representing about 26% of the Western Europe/West Africa population.	Yes (both the SPA and Ramsar site)	The SPA citation (dated 2000) lists 1,900 individuals. The Natura 2000 Standard Data Form (JNCC, updated 2000) also states 1,900 individuals as the 5-year mean (1988-1992) at the time representing 6.8% of the GB breeding population or 4.3% of the GB passage population. Numbers on the site have since declined and between 2011/12 and 2015/16 the pSPA/Ramsar	Highest numbers occur from mid-July to September when adults and juveniles disperse from breeding colonies. The majority use roosts at Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook and Bran Sands (all approximately 7 to 10km south of the proposed scheme footprint at Hartlepool). They feed in shallow inshore waters in and around the estuary mouth.

Species	Population in GB (Natural England, 2018a)	Currently a feature of the existing SPA and Ramsar site (Natural England, 2018a)	pSPA population (Natural England, 2018a)	Usage of the pSPA and Ramsar site (Natural England, 2018a)
			site, including the proposed extensions, supported an average of 134 individuals, representing around 0.3% of the GB passage population	
Little tern *Sternula albifrons*	The breeding population of little terns in Great Britain is estimated to be 1,900 pairs, representing about 10% of the Eastern Atlantic breeding population	Yes. Little tern is also a non-qualifying species of interest for the existing Ramsar site.	The SPA citation (dated 2000) lists 40 pairs. The Natura 2000 Standard Data Form (JNCC, updated 2000) also states 40 pairs as the 4-year mean (1995-1998) at the time representing 1.7% of the GB breeding population. Between 2010 and 2014 the pSPA, including the proposed extensions, supported an average of 81 breeding pairs of little terns, which represent 4.3% of the GB breeding population. Because the little tern population data should, ideally be contemporary with the foraging tern distribution data used to inform the proposed revision to the site boundary (2011-2013), it is proposed that this new, updated population estimate should replace the earlier SPA population estimate.	All British little terns nest on the coast, using sand and shingle beaches and spits, as well as tiny islets of sand or rock close inshore. Virtually all breeding birds are currently located at Crimdon Dene. The feeding grounds of the little terns that nest at Crimdon Dene lie predominantly in marine areas within 5km alongshore of the colony and within 3.5 km offshore.
Regularly occurring migratory species				
Red knot *Calidris canutus*	In 2000 the non-breeding population in Great Britain was estimated to be 290,000 individuals, representing about 84% of the NE Canada & Greenland/Iceland/UK population	Yes (both the SPA and Ramsar site)	Between 1991/92 and 1995/96 the SPA/Ramsar site supported an average of 5,509 individuals which, at that time, represented 1.6% of the NE Canada/Greenland/Iceland/UK population. Numbers have since declined, however the department brief does not propose an amendment to the notified population of 5,509 individuals.	Birds feed at low tide on intertidal mudflats, mussel beds and rocky shores on both sides of the estuary. Formerly present in large numbers in the estuary on Seal Sands, particularly when the rising tide covered other foraging habitats, the birds are now increasingly located outside the estuary, on Coatham Sands, Redcar Rocks and around Hartlepool Headland.

Species	Population in GB (Natural England, 2018a)	Currently a feature of the existing SPA and Ramsar site (Natural England, 2018a)	pSPA population (Natural England, 2018a)	Usage of the pSPA and Ramsar site (Natural England, 2018a)
Common redshank *Tringa totanus*	In 1995 the non-breeding population of common redshank in Great Britain was estimated to be 75,400 individuals, representing about 69% of the north-west European component of the East Atlantic flyway population.	Yes (both the SPA and Ramsar site)	Between 1987 and 1991 the SPA/Ramsar site supported an average of 1,648 individuals which, at that time, represented 1.1% of the East Atlantic population (SPA Citation, 2000). Numbers on the site have since declined and between 2011/12 and 2015/16 the pSPA/Ramsar site, including the proposed extensions, supported an average of 881 individuals representing around 0.3% of the Iceland & Faroes/Western Europe population. No change to the reported population of 1,648 individuals is proposed within the departmental brief.	Within the site birds feed on intertidal mudflats including Seal Sands, North Tees Mudflat, Bran Sands and Hartlepool Bay, saltmarsh areas at Greatham Creek and intertidal rocky shores at Hartlepool Headland, Redcar and Coatham.
Waterbird assemblage				
Assemblage	The site qualifies under Article 4.2 of the Birds Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds, including all Annex 1 species and regularly occurring migratory species outlined above.	Yes – existing qualifying feature	During the period 2011/12-2015/16 the Teesmouth and Cleveland Coast pSPA/Ramsar site, including the proposed extensions, supported an average peak of 26,014 (SPA assemblage) / 26,786 (Ramsar assemblage) individuals. Waterbird species present in nationally important numbers or where their numbers exceed 2,000 individuals comprise: • Eurasian wigeon *Anas penelope* – 2,660 individuals (5 year peak mean 2011/12 to 2015/16) • Gadwall *Anas strepera* – 428 individuals (5 year peak mean 2011/12 to 2015/16). • Northern shoveler *Anas clypeata* – 180 individuals (5 year peak mean 2011/12 to 2015/16)	The departmental brief provides the following information regarding the use of the pSPA / Ramsar site by the cited species in the column to the left during the winter: • Wigeon are found in greatest numbers on the brackish and freshwater pools and adjacent saltmarsh and grasslands around Saltholme, Seaton Common and Greatham Creek. • Gadwall are found in particular concentrations in several locations around the North Tees Marshes. • Northern shoveler are found in greatest numbers in several locations around the North Tees Marshes. • Foraging sanderlings are found in greatest numbers on the wide sandy beaches at Redcar and Coatham Sands, with smaller numbers in Hartlepool Bay. • Herring gulls congregate in large numbers on the intertidal and near-shore waters of Hartlepool Bay and on the open coast north of Hartlepool.

Species	Population in GB (Natural England, 2018a)	Currently a feature of the existing SPA and Ramsar site (Natural England, 2018a)	pSPA population (Natural England, 2018a)	Usage of the pSPA and Ramsar site (Natural England, 2018a)
			• Northern lapwing *Vanellus vanellus* – 3,892 individuals (5 year peak mean 2011/12 to 2015/16) • Sanderling *Calidris alba* – 242 individuals (5 year peak mean 2011/12 to 2015/16) • Herring gull *Larus argentatus* – 3,243 individuals (5 year peak mean 2011/12 to 2015/16) • Black-headed gull *Chroicocephalus ridibundos* – 2,273 individuals (5 year peak mean 2011/12 to 2015/16)	• Black-headed gulls are found in greatest numbers on the intertidal habitats and near-shore waters of Bran Sands, Hartlepool Bay and the open coast north of Hartlepool, and the freshwater pools at Saltholme.

6.1.2 Sites of Special Scientific Interest

Natural England has confirmed that it has undertaken a review of the existing SSSIs around the Teesmouth and Cleveland Coast. Seven SSSIs have been notified previously in the area, comprising Seal Sands, Redcar Rocks, Seaton Dunes and Common, Hartlepool Submerged Forest, South Gare and Coatham Sands, Cowpen Marsh and Tees and Hartlepool Foreshore and Wetlands. Natural England has notified a new SSSI on 31st July 2018, known as the Teesmouth and Cleveland Coast SSSI, which includes the majority of the area of the previously notified SSSIs (Figure 5).

The new site rationalises and clarifies the special interest of the area within a single designation covering 2,977ha, combining and linking existing designations with substantial extensions (totalling 1,584ha). This encompasses key elements of the estuarine and coastal system, including core areas of nesting, feeding and roosting habitats for nationally important numbers of breeding and non-breeding seabirds and waterbirds. Parts of the previously notified Seal Sands SSSI are no longer considered to be of special interest by Natural England, and have therefore been denotified. The ornithological interest of the Teesmouth and Cleveland Coast SSSI is outlined in Table 5 below.

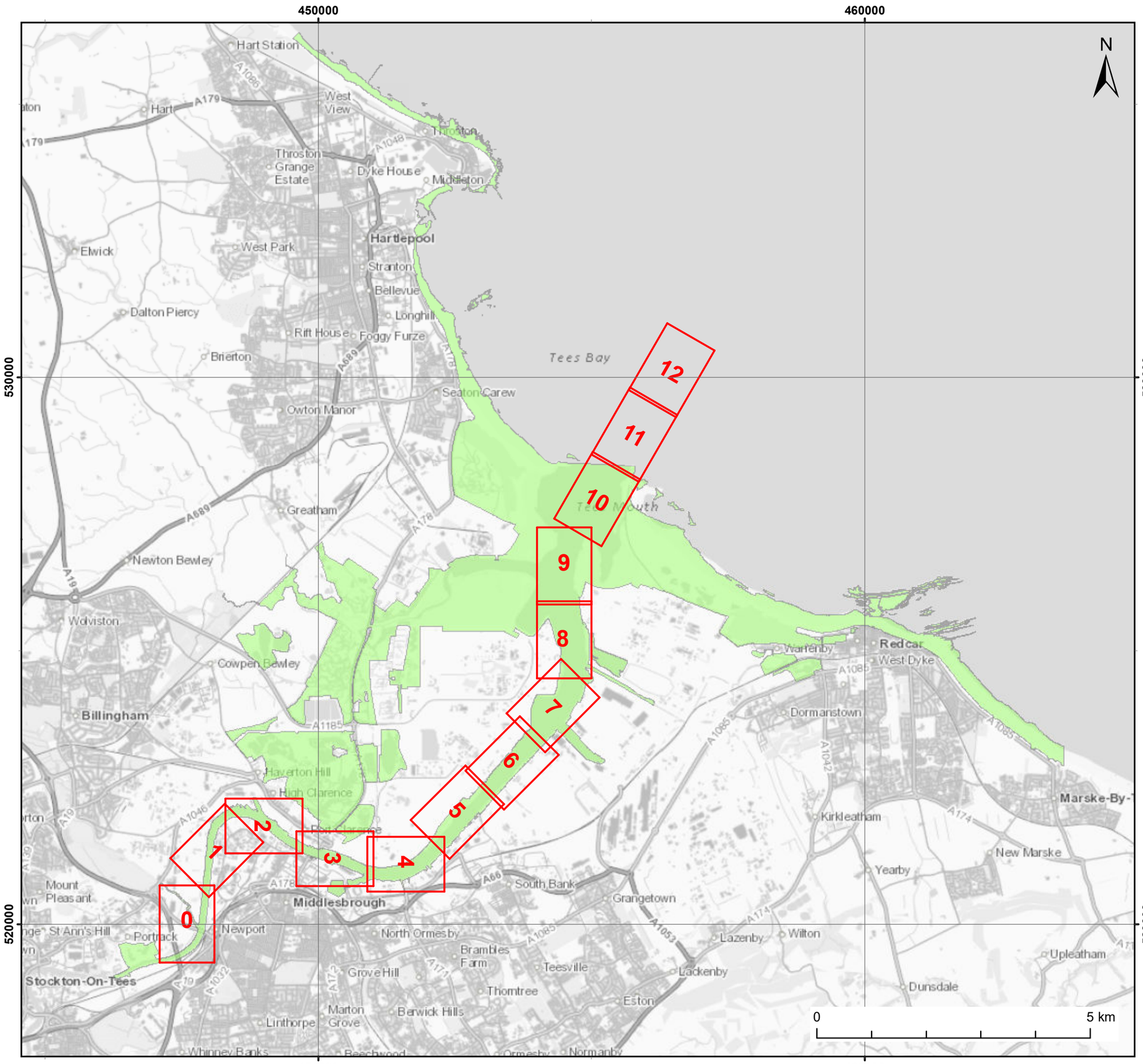
Table 5 Ornithological interest features of the Teesmouth and Cleveland Coast SSSI

Feature	Description
Breeding birds	The site supports nationally important numbers of three breeding species, namely avocet, little tern and common tern. Avocets and common terns both nest within the SSSI. Little terns from a large nearby colony at Crimdon (in the adjacent Durham Coast SSSI), use the SSSI for foraging and pre- and post-breeding gatherings, with only occasional recent nesting attempts. The extensive sand dunes, saltmarshes and wetlands across the site support a diverse assemblage of breeding birds. This includes a number of scarce and declining species, such as shoveler, pochard, ringed plover and little ringed plover.
Non-breeding birds	The extensive areas of open water, grazing marsh and intertidal habitats within the site provide safe feeding and roosting opportunities for large numbers of waterbirds throughout the year. The site is of special interest for its non-breeding populations of ten species, namely shelduck, shoveler, gadwall, ringed plover, knot, ruff, sanderling, purple sandpiper, redshank and sandwich tern, and an assemblage of over 20,000 non-breeding waterbirds. Shoveler, gadwall and ruff are predominantly associated with the extensive freshwater wetlands of the site, while ringed plover, knot, sanderling, purple sandpiper and sandwich tern mostly use the open coast. Redshank are widespread across the site, but the greatest foraging concentrations occur, along with the largest numbers of shelduck, on the intertidal mud of Seal Sands and Greatham Creek. Seal Sands and Bran Sands are also regularly used by ringed plover and knot.

Breeding harbour seals *Phoca vitulina*, are also an interest feature of the SSSI. The Tees Seals Research Programme (INCA, 2018) undertake yearly surveys for assessing the abundance and distribution of the two seal species that are present in the Tees estuary, specifically the common (harbour) seal *Phoca vitulina* and the grey seal *Halichoerus grypus*. The 2018 surveys occurred within the pupping season and covered a period of 40 days from mid-June to mid-July 2018.

A total of 21 harbour seal pups were counted in the 2017 season; a slight increase over previous years. The number of harbour seals at the site has been steadily increasing over previous years. The maximum harbour seal count in 2018 was 112, similar to the count for the 2017 which was 128 (INCA, 2018). The maximum count was recorded in July during pupping season, however the maximum count is typically between August and September during moulting season.

The monitoring indicates that the behaviour of harbour seals has largely remained the same, and the same key haul out sites are still utilised at Seal Sands and Greatham Creek (a tributary of the River Tees. The latest monitoring report describes that since 2015, it has been noticed that seals are also hauling out on a small sandbank at the Bailey Bridge, where Greatham Creek joins Seal Sands.



Legend

- Section
- Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI)

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Client:	Project:
PD Teesport	Tees Maintenance Dredging Baseline Document

Title: Teesmouth and Cleveland Coast SSSI

Figure: 5

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	23/10/2019	TC	ES	A3	1:70,000

Co-ordinate system: British National Grid

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Saltmarshes and sand dunes and invertebrates associated with sand dunes are also interest features of the Teesmouth and Cleveland Coast SSSI. Saltmarsh is present within the estuary, most extensively at Greatham Creek. Sand dunes flank both sides of the estuary, with the two main dune systems at Seaton Dunes to the North of the Tees and Coatham Dunes to the South. The sand dunes within the site supports a nationally important invertebrate assemblage, including at least 14 threatened species.

6.1.3 Memorandum of Understanding for the Teesmouth and Cleveland Coast Special Protection Area and proposed extension

As noted above, Natural England is considering proposals to extend the boundary and interest features of the Teesmouth and Cleveland Coast SPA. This announcement (in 2015) initially created concern / challenge amongst some industry stakeholders, specifically regarding potential implications on future development applications or activities within the Tees estuary.

The Tees Estuary Partnership (TEP) was subsequently formed (in 2016), and is made up of businesses, industry, regulators, local government and environmental organisations.

One of the aspirations of the TEP was for regulators to set out a 'Memorandum of Understanding' (MoU) for the Tees estuary. The MoU (principles document) was produced in October 2017, and has been signed by the MMO, Environment Agency and Natural England. As well as protecting and enhancing the nature conservation sites along the Teesmouth and Cleveland coast, the MoU is intended to make it easier for developers and businesses to navigate through the regulatory framework in a number of ways, including:

- Providing a single point of entry – pointing applicants to other bodies as relevant and in some cases proactively informing other MoU signatories or consenting bodies that an application or an advice request has been received.
- One lead authority – aiming to reduce the duplication of evidence requirements and to streamline regulatory processes around Environmental Impact Assessments and Habitats Regulations Assessments.
- Dispensing with, or deferring regulatory responsibilities – exploring the legal options available for streamlining within the regulatory process.
- Certainty on evidence requirements – identifying common evidence needs, enabling parallel tracking of work to satisfy evidence requirements, and assessing the level of support that could be provided to proactively fill strategic gaps in evidence.
- Co-ordination of advice – providing coordinated advice between organisations within agreed timescales.

The second part of the TEP's vision for the Tees seeks ambitious outcomes for nature conservation, exploring the development of a habitat banking system which will facilitate a wide range of environmental projects and simultaneously enable future developments on the estuary.

6.2 Sediment quality data

Condition 5.2.3 of PDTs maintenance dredge and disposal licence states that:

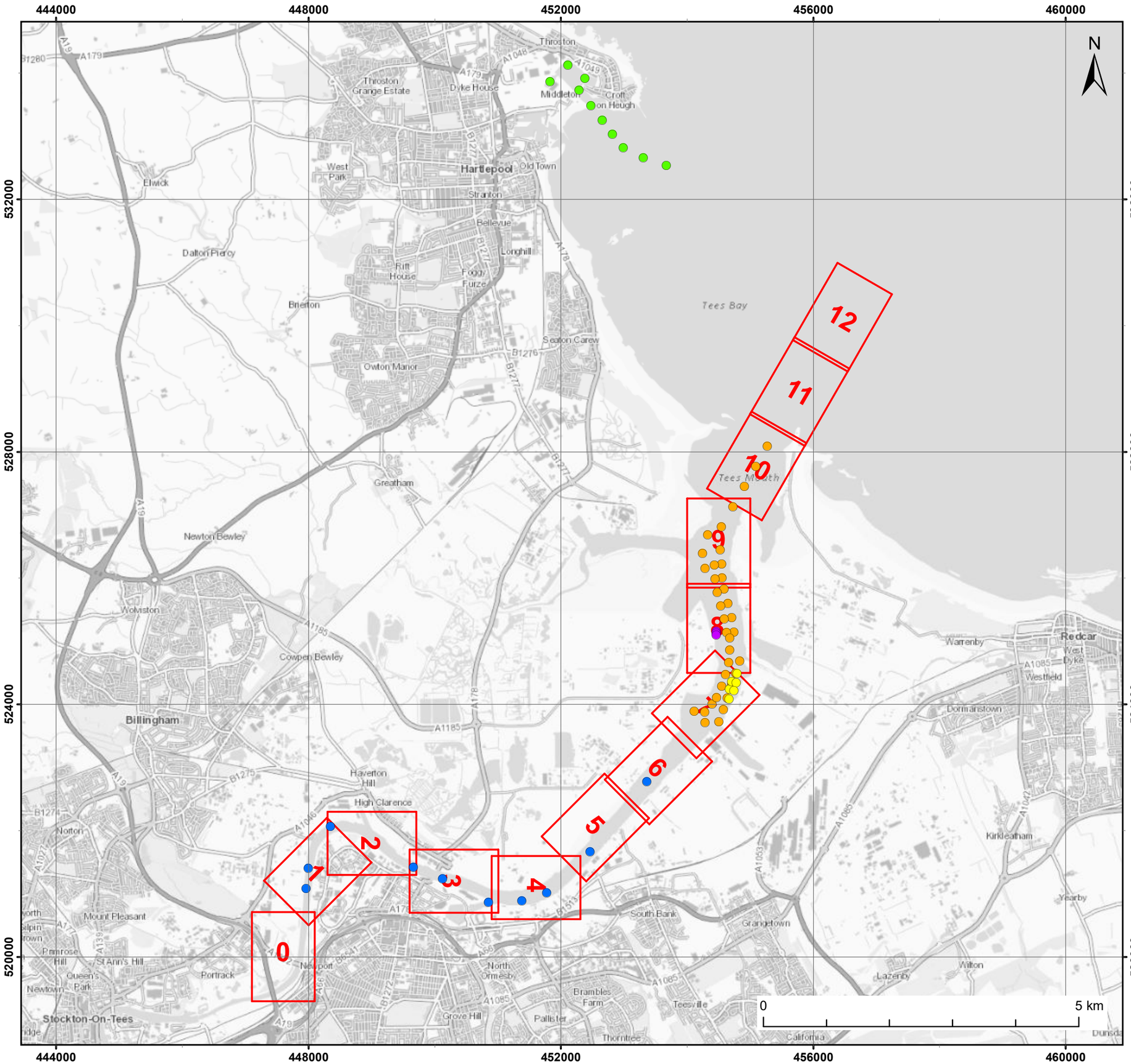
"a regime of future sediment sampling is undertaken by PDT, of at least three yearly intervals, which must be agreed in advance with the MMO. Samples must be collected, analysed and the report of their notification signed off prior to dredging in the fourth and subsequently the seventh and tenth year of this licence".

Sampling and analysis was undertaken in 2015 to inform the 10 year licence application. Therefore PDT was required to undertake sediment sampling in 2018 to ensure it complies with the marine licence condition

5.2.3. PDT were already planning to undertake sampling to support marine licence applications for NGCT (Section 5.1) and Hartlepool approach channel (Section 5.5). The MMO accepted that the sampling already planned within the Tees estuary could be used to inform the mid-licence sampling requirements for the maintenance dredge and disposal licence, detailed within the sampling plans provided by the MMO for both developments (SAM/2018/00069 and SAM/2018/00050 for NGCT and Hartlepool channel respectively). The sampling plan for NGCT also stated that as the maintenance dredge footprint extends beyond the NGCT dredge footprint, the sampling would need to be supplemented with 10 surface samples collected upstream of NCGT, and samples collected as part of a Tees GasPort (SAM/2018/00005) would also need to be submitted in support of the mid-licence sampling requirements. Similar detail was included within the Hartlepool approach channel sampling plan (SAM/2018/00050); the MMO advised that three of the 10 samples required should be located within the maintenance dredge area at Victoria Harbour, outside of the capital dredge footprint for the Hartlepool approach channel project. The sample locations used to support the mid-licence sampling requirements are provided in Figure 6 below. The results of the sediment sample analysis are provided in Sections 6.2.2 – 6.2.5 below. Following receipt of the sediment quality data the MMO has discharged condition 5.2.3 in relation to providing sediment quality data in advance of the fourth year of the licence. It should be noted the Condition 5.3.2 also requires sediment quality data provided prior to year seven and 10 of the licence.

Further sampling has been undertaken in the Tees for the Inter Terminals Seal Sands Jetty 1 Upgrade in March 2019 (SAM/2018/00054) which are also within the maintenance dredge footprint. The results of the sediment sampling are also provided below for completeness (Section 6.2.6).

Section 6.2.1 below outlines the guidelines used to analyse the concentrations of contaminants in sediment.



Legend

- Section
- Sediment sampling locations for NGCT
- Sediment sampling locations for Tees Gasport
- Sediment sampling locations for Interterminals
- Sediment sampling locations for Hartlepool Channel Dredge
- Maintenance dredge samples upstream of NGCT

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Client:	Project:
PD Teesport	Tees Maintenance Dredging Baseline Document

Title: Sediment quality survey sample locations

Figure: 6

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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6.2.1 Methodology for analysis of sediment quality data

The analysis of sediment quality data has been undertaken in accordance with recognised guidelines and Action Levels, namely:

- Cefas Guideline Action Levels for the disposal of dredged material (Cefas, 2000); and,
- Canadian Sediment Quality Guidelines (CSQG) for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment (CCME), 2002).

The Cefas Action Levels are used as part of a 'weight of evidence' approach to assessing the suitability of dredged material for disposal at sea, but are not themselves statutory standards. Selected ALs are set out in Table 6.

Cefas guidance indicates that, in general, concentrations of contaminants within sediment which are below Action Levels are not considered to be of concern and are, therefore, likely to be approved for disposal at sea. Material with concentrations of contaminants above Action Level 2 is generally considered to be unsuitable for disposal at sea. Dredged material with contaminant concentrations between Action Level 1 and 2 requires further consideration before a decision can be made. Comparison of results from sediment quality analysis with Cefas ALs therefore provides a good indication regarding the risk of the material to the environment.

The CSQG involved the derivation of interim marine sediment quality guidelines (ISQGs), or Threshold Effect Levels (TEL) and Probable Effect Levels (PEL). These levels were derived from an extensive database containing direct measurements of toxicity of contaminated sediments to a range of aquatic organisms exposed in laboratory tests and under field conditions (CCME, 2002). As a result, these guidelines provide an indication of likely toxicity of sediments to aquatic organisms. However, these guidelines should be used with caution as they were designed specifically for Canada and are based on the protection of pristine environments. In the absence of suitable alternatives, however, it has become commonplace for these guidelines to be used by regulatory and statutory bodies in the UK, and elsewhere, as part of a 'weight of evidence' approach.

Table 6 Selected Cefas Action Levels

Contaminant	Action Level 1 (mg/kg)	Action Level 2 (mg/kg)
Arsenic	20	100
Cadmium	0.4	5
Chromium	40	400
Copper	40	400
Nickel	20	200
Mercury	0.3	3
Lead	50	500
Zinc	130	800
Organotins (TBT, DBT)	0.1	1
PCBs (sum of ICES 7)	0.01	None
PCBs (sum of 25 congeners)	0.02	0.2
PAHs	0.1	None

Contaminant	Action Level 1 (mg/kg)	Action Level 2 (mg/kg)
DDT	0.001	None
Dieldrin	0.005	None

Selected Canadian guidelines are presented in Table 7 and comprise two assessment levels. The lower level is referred to as the TEL and represents the concentration below which adverse biological effects are expected to occur only rarely (in some sensitive species for example). The higher level, the PEL, defines a concentration above which adverse effects may be expected in a wider range of organisms.

Table 7 Selected CSQG values (taken from CCME, 2002)

Contaminant	Units	TEL	PEL
Arsenic	mg/kg	7.24	41.6
Cadmium	mg/kg	0.7	4.2
Chromium	mg/kg	52.3	160
Copper	mg/kg	18.7	108
Mercury	mg/kg	0.13	0.7
Lead	mg/kg	30.2	112
Zinc	mg/kg	124	247
Acenaphthene	µg/kg	6.71	88.9
Acenaphthylene	µg/kg	5.87	128
Anthracene	µg/kg	46.9	245
Benz(a)anthracene	µg/kg	74.8	693
Benzo(a)pyrene	µg/kg	88.8	763
Chrysene	µg/kg	108	846
Dibenz(a,h)anthracene	µg/kg	6.22	135
Fluoranthene	µg/kg	113	1,494
Fluorene	µg/kg	21.2	144
Napthalene	µg/kg	34.6	391
Phenanthrene	µg/kg	86.7	544
Pyrene	µg/kg	153	1,398

6.2.2 Results from NGCT sediment quality survey 2019

A sediment quality survey was undertaken in July and August 2019 in accordance with the requirements set out in the MMO's sample plan (SAM/2018/00069). The survey comprised the recovery of 37 surface samples within and adjacent to the proposed dredge envelope. The MMO confirmed that sampling at depth was not required due to ground conditions evidenced through borehole logs, recovered by PDT and submitted in support of the sampling plan request to the MMO. A summary of the data is provided in Table 8.

Table 8 Summary of sediment quality data from the NGCT site specific sediment quality survey

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
Arsenic	6.9	33.3	Yes (29)	No (0)	Yes (35)	No (0)
Cadmium	0.04	0.59	Yes (3)	No (0)	No (0)	No (0)
Chromium	5.4	52.2	Yes (11)	No (0)	No (0)	No (0)
Copper	7.8	74.3	Yes (11)	No (0)	Yes (31)	No (0)
Mercury	0.05	0.6	Yes (21)	No (0)	Yes (32)	No (0)
Nickel	5.2	35.6	Yes (26)	No (0)	No (0)	No (0)
Lead	13.2	135	Yes (29)	No (0)	Yes (33)	Yes (6)
Zinc	35.2	254	Yes (22)	No (0)	Yes (25)	Yes (2)
DBT	<0.005	0.020	No (0)	No (0)	No (0)	No (0)
TBT	<0.005	0.014	No (0)	No (0)	No (0)	No (0)
Acenaphthene	0.04	0.88	No (0)	-	Yes (36)	Yes (33)
Acenaphthylene	0.02	3.78	Yes (1)	-	Yes (36)	Yes (19)
Anthracene	0.05	1.20	Yes (1)	-	Yes (36)	Yes (36)
Benzo(a)anthracene	0.07	1.15	Yes (1)	-	Yes (36)	Yes (5)
Benzo(a)pyrene	0.06	1.10	Yes (1)	-	Yes (34)	Yes (4)
Benzo(b)fluoranthene	0.04	0.96	No (0)	-	-	-
Benzo(e)pyrene	0.09	0.85	No (0)	-	-	-
Benzo(ghi)perylene	0.08	0.81	No (0)	-	-	-
Benzo(k)fluoranthene	0.02	0.52	No (0)	-	-	-
C1 Naphthalene	2.14	7.83	Yes (36)	-	-	-
C1 Phenanthrene	0.65	4.55	Yes (33)	-	-	-
C2 Naphthalene	1.42	5.46	Yes (36)	-	-	-
C3 Naphthalene	1.05	3.35	Yes (36)	-	-	-
Chrysene	0.10	1.05	Yes (2)	-	Yes (34)	Yes (3)
Dibenzo(ah)anthracene	0.01	0.16	No (0)	-	Yes (36)	Yes (5)
Fluoranthene	0.10	2.20	Yes (19)	-	Yes (35)	Yes (4)
Fluorene	0.10	3.00	Yes (1)	-	Yes (36)	Yes (33)
Indeno(1,2,3-c,d)pyrene	0.02	0.65	No (0)	-	-	-
Naphthalene	0.70	1.94	Yes (33)	-	Yes (36)	Yes (36)
Perylene	0.006	0.23	No (0)	-	-	-
Phenanthrene	0.54	5.83	Yes (33)	-	Yes (36)	Yes (36)
Pyrene	0.13	2.54	Yes (17)	-	Yes (34)	Yes (4)
PCB – sum of ICES7	0.004	0.006	Yes (1)	-	-	-

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
PCB – sum of ICES25	0.008	0.014	Yes (1)	No (0)	-	-
Alpha-hexachlorocyclohexane	<0.0001	0.00028	-	-	-	-
Beta-hexachlorocyclohexane	<0.0001	0.00014	-	-	-	-
Gamma-hexachlorocyclohexane	<0.0001	0.00134	-	-	-	-
Dieldrin	<0.0001	0.00059	No (0)	-	-	-
Hexachlorobenzene	0.00018	0.00868	-	-	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethane (PPTDE)	0.00012	0.00204	-	-	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	0.00020	0.00106	-	-	-	-
Dichlorodiphenyltrichloroethane (PPDDT)	<0.0001	0.00389	Yes (2)	-	-	-
BDE17	<0.00002	0.000926	-	-	-	-
BDE28	<0.00002	0.000701	-	-	-	-
BDE47	0.000104	0.00417	-	-	-	-
BDE66	<0.00002	0.000707	-	-	-	-
BDE85	<0.00002	0.000278	-	-	-	-
BDE99	0.0000988	0.00493	-	-	-	-
BDE100	0.0000202	0.000598	-	-	-	-
BDE138	<0.00002	<0.00002	-	-	-	-
BDE153	<0.00002	0.000968	-	-	-	-
BDE154	<0.00002	0.000466	-	-	-	-
BDE183	<0.00002	0.000841	-	-	-	-
BDE209	0.00381	0.407	-	-	-	-

Concentrations of metals in the vast majority of samples were elevated above Action Level 1 (30 of the 36 samples contained at least one metal above Action Level 1). The exceedances above Action Level 1 were marginal only. There were no exceedances of Action Level 2. With regard to the CSQG values, the vast majority of samples contained arsenic, copper, mercury, lead and zinc in concentrations above the TEL.

Concentrations of organotins in all samples were below Action Level 1. In the vast majority of cases, concentrations were less than the laboratory detection limit. There is no TEL or PEL for organotins and therefore screening of the results against the CSQG was not possible.

Concentrations of at least one PAH compound were present above Action Level 1 in samples recovered (and the TEL and PEL where available). There is no Action Level 2 for PAH compounds.

The concentrations ranged from marginal exceedances above Action Level 1 with regard to the majority of PAH compounds, however, concentrations of napthalenes were present in one location adjacent to Teesport up to seven times greater than Action Level 1 (however were generally two or three times the Action Level 1 value). Concentrations of C1 Naphthalene, C2 Naphthalene and C3 Naphthalene were present above Action Level 1 in all 36 samples, whilst C1 Phenanthrene, Naphthalene and Phenanthrene were elevated above Action Level 1 in 33 samples. Concentrations of total hydrocarbons (THC) were also relatively high, peaking at 975mg/kg.

Concentrations of PAH compounds within the Tees estuary have historically been elevated, and based on the results of the 2006 sampling effort, there does not appear to have been a significant change in the concentrations of these contaminants throughout the estuary over time.

One sample analysed contained PCBs (sum of ICES7 and sum of 25 congeners) in concentrations marginally greater than Action Level 1 and no exceedances of Action Level 2 were recorded.

The concentration of organochlorines present was generally less than the laboratory detection limit of 0.0001mg/kg. Dieldrin was not located in any sample above Action Level 1, whilst DDT was marginally elevated in two of the 36 samples analysed. There is no Action Level 2 for OCPs or CSQG values.

As detailed above, the concentrations of PDBEs ranged from <0.02µg/kg to 4.93µg/kg (excluding BDE209). The concentrations of BDE209 ranged from 3.81µg/kg to 407µg/kg.

Cefas has previously advised (within SAM/2018/00069) that the distribution and concentrations of PBDE congeners in the marine environment are highly variable, and whilst named as a Chemical for Priority Action, there are no formal OSPAR assessment values developed with which to assess status. The significance of the concentrations reported above has therefore been informed by a review of concentrations present within historic samples within the Tees, as well as information provided by Cefas and the MMO within SAM/2018/00069.

Within SAM/2018/00069, Cefas stated that BDE congener 209 is generally expected to be found in much higher concentrations in the marine environment (compared with the results of the other BDE congeners); the data presented above confirms this expectation. This trend was also evident within the findings of the sediment samples recovered in 2006, with BDE209 concentrations ranging from <0.5µg/kg to 340µg/kg. The results of BDE209 are marginally higher than that found in 2006, however, are lower than the concentrations found within the upstream part of the Tees estuary during 2018 (which had a peak of 912µg/kg for BDE209) (section 6.2.3 below). The upstream samples were recovered as part of the mid-licence sampling requirements on the maintenance dredge disposal licence (reference L/2015/00427/4). The MMO did not apply any exclusion zones to the maintenance dredge disposal licence following review of the PDBE results. As the results from the NGCT footprint are lower than those found upstream, it is concluded that the concentrations of PBDEs are not a cause for concern.

6.2.3 Results from upstream Tees estuary sediment quality survey 2018

In addition to the samples collected for NGCT, 10 surface sediment samples were collected upstream of the proposed NGCT dredge footprint in December 2018 to ensure the maintenance dredge footprint was adequately sampled, following the requirements of the sapling plan from the MMO (SAM/2018/00069). A summary of the results is provided in Table 9 below.

Table 9 Summary of sediment quality data from the maintenance dredge footprint upstream of NGCT

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
Arsenic	14.2	26.3	Yes (4)	No (0)	Yes (10)	No (0)
Cadmium	0.46	2.61	Yes (10)	No (0)	No (7)	No (0)
Chromium	50.7	138	Yes (10)	No (0)	No (9)	No (0)
Copper	53.6	182	Yes (10)	No (0)	Yes (10)	Yes (4)
Mercury	0.47	2.06	Yes (10)	No (0)	Yes (10)	Yes (5)
Nickel	19.2	38.4	Yes (9)	No (0)	No (0)	No (0)
Lead	120	385	Yes (10)	No (0)	Yes (10)	Yes (10)
Zinc	167	680	Yes (10)	No (0)	Yes (10)	Yes (6)
DBT	0.018	0.039	No (0)	No (0)	No (0)	No (0)
TBT	0.021	0.101	No (0)	No (0)	No (0)	No (0)
Acenaphthene	0.379	1.84	Yes (10)	-	Yes (10)	Yes (10)
Acenaphthylene	0.239	0.746	Yes (10)	-	Yes (10)	Yes (10)
Anthracene	0.452	2.04	Yes (10)	-	Yes (10)	Yes (10)
Benzo(a)anthracene	0.997	5.44	Yes (10)	-	Yes (10)	Yes (10)
Benzo(a)pyrene	1.03	6.06	Yes (10)	-	Yes (10)	Yes (10)
Benzo(b)fluoranthene	0.938	5.69	Yes (10)	-	-	-
Benzo(e)pyrene	0.896	4.2	Yes (10)	-	-	-
Benzo(ghi)perylene	0.84	3.96	Yes (10)	-	-	-
Benzo(k)fluoranthene	0.446	2.35	Yes (10)	-	-	-
C1 Naphthalene	1.22	5.24	Yes (10)	-	-	-
C1 Phenanthrene	1.08	3.62	Yes (10)	-	-	-
C2 Naphthalene	1.05	4.61	Yes (10)	-	-	-
C3 Naphthalene	0.985	3.95	Yes (10)	-	-	-
Chrysene	0.971	4.66	Yes (10)	-	Yes (10)	Yes (10)
Dibenzo(ah)anthracene	0.163	0.824	Yes (10)	-	Yes (10)	Yes (10)
Fluoranthene	1.92	12.8	Yes (10)	-	Yes (10)	Yes (10))
Fluorene	0.471	1.72	Yes (10)	-	Yes (10)	Yes (10)
Indeno(1,2,3-c,d)pyrene	0.729	4.15	Yes (10)	-	-	-
Naphthalene	0.916	3.58	Yes (10)	-	Yes (10)	Yes (10)
Perylene	0.302	1.86	Yes (10)	-	-	-
Phenanthrene	1.52	5.51	Yes (10)	-	Yes (10)	Yes (10)
Pyrene	1.9	10.6	Yes (10)	-	Yes (10)	Yes (10)
PCB – sum of ICES7	0.009	1.07	Yes (9)	-	-	-

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
PCB – sum of ICES25	0.018	1.91	Yes (10)	Yes (1)	-	-
Alpha-hexachlorocyclohexane	0.0001	0.00173	-	-	-	-
Beta-hexachlorocyclohexane	0.0001	0.00088	-	-	-	-
Gamma-hexachlorocyclohexane	0.00021	0.00155	-	-	-	-
Dieldrin	0.00041	0.00519	Yes (1)	-	-	-
Hexachlorobenzene	0.00199	0.0457	-	-	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	0.0015	0.0129		-	-	-
Dichlorodiphenyltrichloroethane (PPDDT)	0.00134	0.0265	Yes (10)	-	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethane (PPTDE)	0.00019	0.00291	-	-	-	-
BDE17	0.00033	0.0007	-	-	-	-
BDE28	0.00024	0.00048	-	-	-	-
BDE47	0.00138	0.00264	-	-	-	-
BDE66	0.00014	0.0004	-	-	-	-
BDE85	0.00008	0.00016	-	-	-	-
BDE99	0.00119	0.00242	-	-	-	-
BDE100	0.00026	0.00043	-	-	-	-
BDE138	0.00005	0.00028	-	-	-	-
BDE153	0.00029	0.0005	-	-	-	-
BDE154	0.00022	0.00036	-	-	-	-
BDE183	0.00055	0.00119	-	-	-	-
BDE209	0.247	0.912	-	-	-	-

The results showed there was 1 exceedance of Action Level 2 which was PCB (Sum of 25 congeners). Minor exceedances of Action Level1 were present at all locations for metals and PAHs. With regard to the CSQG values, the vast majority of samples contained copper, mercury, lead and zinc in concentrations above the TEL. All organotins were recorded were below Action Level 1.

The concentration of organochlorines present was generally above the laboratory detection limit of 0.0001mg/kg. Dieldrin was Action Level 1 at 1 location, whilst DDT was marginally elevated in all locations.

The concentrations of PDBEs ranged from 0.08µg/kg to 2.64µg/kg (excluding BDE209). The concentrations of BDE209 ranged from 247µg/kg to 912µg/kg. As stated in Section 6.2.1, despite the elevated levels of BDE209 the MMO did not apply any exclusion zones to the maintenance dredge disposal licence following review of the PDBE results.

The results show that sediment collected from Billingham Reach were above Action Level 2 for PCB (sum of 25 congeners). As a result, the MMO placed an exclusion on disposal to sea of material from the Billingham Reach Area (Condition 5.2.9 on L/2015/00427/4). Four further samples were subsequently collected from the Billingham Reach Area through agreement with the MMO, with further analysis undertaken for PCBs. No exceedances of Action Level 2 were recorded for PCBs in the four additional samples, and only one slight exceedance of Action Level1. Following the submission of the sediment data the marine licence has been varied and the exclusion at Billingham Reach has been removed.

6.2.4 Results from the Tees GasPort scheme sediment quality survey 2018

A sediment quality survey was undertaken in support of the marine licence application for the Teesside GasPort scheme in 2018, which is located within the footprint of the proposed NGCT. The survey for the Tees GasPort scheme comprised recovery of six surface samples from the proposed dredge footprint for that scheme (as agreed in SAM/2018/00005 (see Figure 6)). Samples were recovered in October 2018 and were analysed by the National Laboratory Service (NLS). A summary of the data is provided in Table 10 below.

Table 10 Summary of sediment quality data from the Tees GasPort scheme (2018)

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
Arsenic	23.5	27.9	Yes (6)	No	Yes (6)	No
Cadmium	0.234	0.366	No	No	No	No
Chromium	68.1	83.1	Yes (6)	No	Yes (6)	No
Copper	34.6	48.4	Yes (3)	No	Yes (6)	No
Mercury	0.302	0.524	Yes (6)	No	Yes (6)	No
Nickel	30.1	35.8	Yes (6)	No	-	-
Lead	90.6	113	Yes (6)	No	Yes (6)	Yes (1)
Zinc	147	190	Yes (6)	No	Yes (6)	No (0)
DBT	<0.009	0.0011	No	No	-	-
TBT	0.0114	0.0189	No	No	-	-
Acenaphthene	0.083367	0.383981	Yes (5)	No	Yes (6)	Yes (5)
Acenaphthylene	0.072106	0.08986	No	No	Yes (6)	No
Anthracene	0.094496	0.425018	Yes (5)	No	Yes (6)	Yes (3)
Benzo(a)anthracene	0.176986	1.025433	Yes (6)	No	Yes (6)	Yes (3)
Benzo(a)pyrene	0.130976	0.852781	Yes (6)	No	Yes (6)	Yes (1)
Benzo(b)fluoranthene	0.156179	0.975849	Yes (6)	No	-	-

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
Benzo(e)pyrene	0.141463	0.833184	Yes (6)	No	-	-
Benzo(ghi)perylene	0.10508	0.829704	Yes (6)	No	-	-
Benzo(k)fluoranthene	0.066859	0.433551	Yes (4)	No	-	-
C1 Naphthalene	0.926859	5.071459	Yes (6)	No	-	-
C1 Phenanthrene	0.700803	3.599416	Yes (6)	No	-	-
C2 Naphthalene	0.880869	4.854572	Yes (6)	No	-	-
C3 Naphthalene	0.662793	3.522597	Yes (6)	No	-	-
Chrysene	0.15134	0.880049	Yes (6)	No	Yes (6)	Yes (1)
Dibenzo(ah)anthracene	0.124132	0.160211	Yes (3)	No	Yes (6)	Yes (2)
Fluoranthene	0.427686	2.053173	Yes (6)	No	Yes (6)	Yes (2)
Fluorene	0.12137	0.564042	Yes (6)	No	Yes (6)	Yes (5)
Indeno(1,2,3-c,d)pyrene	0.078357	0.59554	Yes (5)	No	-	-
Naphthalene	0.3528	1.891173	Yes (6)	No	Yes (6)	Yes (5)
Perylene	0.03248	0.213124	Yes (3)	No	-	-
Phenanthrene	0.50817	2.62192	Yes (6)	No	Yes (6)	Yes (5)
Pyrene	0.391734	2.004324	Yes (6)	No	Yes (6)	Yes (3)
PCB - 018 : Dry Wt	0.000255	0.000373	No	No	-	-
PCB - 028 : Dry Wt	0.000532	0.000687	No	No	-	-
PCB - 031 : Dry Wt	0.000395	0.000498	No	No	-	-
PCB - 044 : Dry Wt	0.000262	0.000342	No	No	-	-
PCB - 047 : Dry Wt	0.000172	0.00024	No	No	-	-
PCB - 049 : Dry Wt	0.000205	0.000257	No	No	-	-
PCB - 052 : Dry Wt	0.000401	0.000514	No	No	-	-
PCB - 066 : Dry Wt	0.0003	0.000462	No	No	-	-
PCB - 101 : Dry Wt	0.000537	0.00072	No	No	-	-
PCB - 105 : Dry Wt	0.0002	0.000248	No	No	-	-
PCB - 110 : Dry Wt	0.000511	0.000734	No	No	-	-
PCB - 118 : Dry Wt	0.000594	0.000767	No	No	-	-
PCB - 128 : Dry Wt	0.000149	0.000178	No	No	-	-
PCB - 138 : Dry Wt	0.000432	0.000554	No	No	-	-

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
PCB - 141 : Dry Wt	0.000108	0.000108	No	No	-	-
PCB - 149 : Dry Wt	0.000398	0.0006	No	No	-	-
PCB - 151 : Dry Wt	0.000116	0.000189	No	No	-	-
PCB - 153 : Dry Wt	0.000625	0.000814	No	No	-	-
PCB - 156 : Dry Wt	0.000083	0.0001	No	No	-	-
PCB - 158 : Dry Wt	0.000082	0.000088	No	No	-	-
PCB - 170 : Dry Wt	0.000144	0.00024	No	No	-	-
PCB - 180 : Dry Wt	0.000388	0.000533	No	No	-	-
PCB - 183 : Dry Wt	0.000108	0.000157	No	No	-	-
PCB - 187 : Dry Wt	0.000275	0.000374	No	No	-	-
PCB - 194 : Dry Wt	0.00009	0.000114	No	No	-	-

As shown above, concentrations of contaminants were not present in excess of Action Level 2 at any location within the proposed Tees GasPort dredge footprint. Minor exceedances of Action Level 1 were present for most metals, at most sample locations. The vast majority of PAH compounds were also present in concentrations above Action Level1. PCBs were present in concentrations below Action Level 1 at all locations.

Comparison of the sediment quality data with the CSQG has identified elevated concentrations of metals above the TEL threshold at most locations. However, no exceedances of the PEL were recorded for trace metals, with the exception of lead at one location only. There were exceedances of the PEL for a number of PAH compounds.

6.2.5 Results from Hartlepool approach channel sediment quality survey (2018)

This section presents a summary of the laboratory analysis undertaken on the 10 surface sediment samples recovered from within the maintenance dredge footprint at Hartlepool (which largely overlaps with the now consented capital dredge envelope for the Hartlepool approach channel project). . The sediment quality survey was undertaken in October 2018, seven of the 10 samples were recovered to inform both the marine licence application for the now consented capital dredge at Hartlepool channel (SAM/2018/00050), as well as the mid-licence sampling requirements on L/2015/00427/4. As requested by the MMO, three of the 10 samples were located within Victoria Harbour, outside of the capital dredge envelope, but within the maintenance dredge footprint at Hartlepool.

As reported in Table 11, there were elevations of Action Level 1 (and the TEL) at all locations for at least one metal; however, no exceedances of Action Level 2 were recorded. The PEL was exceeded at 1 location for lead. Samples 8 to 10 were found to contain only very marginally elevated concentrations of arsenic above Action Level 1. All other metals and organotins present in samples 8 to 10 were below Action Level 1.

Table 11 Summary of sediment quality data from the Hartlepool channel site specific sediment quality survey

Contaminant	Min. conc. (mg/kg)	Max. conc. (mg/kg)	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance	PEL exceedance
Arsenic	18.5	39.6	Yes (9)	No (0)	Yes (7)	No (0)
Cadmium	0.073	0.215	No (0)	No (0)	No (0)	No (0)
Chromium	16.7	88.2.7	Yes (6)	No (0)	Yes (6)	No (0)
Copper	8.27	57.4	No (3)	No (0)	Yes (7)	No (0)
Mercury	0.039	0.368	Yes (5)	No (0)	Yes (7)	No (0)
Nickel	9.42	38.2	Yes (7)	No (0)	-	-
Lead	24.8	123	Yes (7)	No (0)	Yes (6)	Yes (1)
Zinc	56.7	221	Yes (5)	No (0)	Yes (6)	No (0)
DBT	<LOD	0.00741	No (0)	No (0)	-	-
TBT	<LOD	0.0166	No (0)	No (0)	-	-
Acenapthene	<LOD	<LOD	No (0)	-	No (0)	No (0)
Acenapthylene	<LOD	<LOD	No (0)	-	No (0)	No (0)
Anthracene	<LOD	0.47223	Yes (6)	-	Yes (3)	Yes (4)
Benz(a)anthracene	<LOD	0.83764	Yes (6)	-	Yes (5)	Yes (2)
Benzo(a)pyrene	<LOD	0.575004	Yes (6)	-	Yes (6)	No (0)
Benzo(b)fluoranthene	<LOD	0.642359	Yes (6)	-	-	-
Benzo(g,h,i)perylene	<LOD	0.558755	Yes (6)	-	-	-
Benzo(e)pyrene	<LOD	0.649038	Yes (6)	-	-	-
Benzo(k)fluoranthene	<LOD	0.288141	Yes (5)	-	-	-
C1-napthalenes	0.458125	10.74545	Yes (10	-	-	-
C1-phenanthrenes	0.22586	5.600085	Yes (10)	-	-	-
C2-napthalenes	0.442963	10.44786	Yes (10)	-	-	-
C3-napthalenes	0.301521	7.250214	Yes (10)	-	-	-
Chrysene	<LOD	0.723167	Yes (6)	-	Yes (6)	No (0)
Dibenz(a,h)anthracene	<LOD	0.105163	Yes (2)	-	Yes (6)	No (0)
Fluoranthene	0.045435	1.616836	Yes (7)	-	Yes (4)	Yes (3)
Fluorene	<LOD	0.577299	Yes (6)	-	Yes (3	Yes (6)
Indeno(123-cd)pyrene	<LOD	0.405161	Yes (6)	-	-	-
Napthalene	0.133967	3.826396	Yes (10)	-	Yes (4)	Yes (6)
Perylene	<LOD	<LOD	No (0)	-	-	-
Phenanthrene	0.13749	3.843338	Yes (10)	-	Yes (4)	Yes (6)
Pyrene	0.043093	1.481493	Yes (7)	-	Yes (5)	Yes (2)

Contaminant	Min. conc. (mg/kg)	Max. conc. (mg/kg)	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance	PEL exceedance
Total hydrocarbon content	181	3,630	-	-	-	-

Table 11 also summarises the results of the PAH concentrations within the sediment. PAHs were found to be present in sediments above Action Level 1 (and the TEL and PEL where levels are available) at a number of locations. Exceedances ranged from marginal, to up to 10 times the Action Level 1 value (in the case of C1-napthalenes and C2-napthalenes). There is no Action Level 2 available for PAHs. The concentration of THC were found to be high, peaking at 3,630mg/kg. Overall, the concentrations of THC present in the samples recovered in 2018 were less than those encountered during a sediment survey in 2012, collected in support for the maintenance dredge licence (L/2015/00427/4), of which three samples were collected at Hartlepool (from 'Hartlepool Docks', 'Hartlepool Approaches/Bay' and 'Hartlepool Bay'). The sediment samples collected from these sites were considered acceptable for offshore disposal (as the MMO granted PDT with a licence to dispose of such material). Additionally, as the MMO has granted a marine licence for the Hartlepool approach channel project, it is concluded that the presence of high concentrations of THC and PAHs are not cause for concern with regard to disposal of dredged material to sea.

6.2.6 Results from Inter Terminals Seal Sands – Jetty 1 Upgrade sediment quality survey 2019

A sediment quality survey was undertaken in support of a marine licence application for Inter Terminals Seal Sands Jetty 1 upgrade. The survey was undertaken during March 2019 in accordance with the agreed sampling plan from the MMO (SAM/2018/00054). As shown on Figure 6, a total of nine samples were recovered from three sampling stations evenly located throughout the proposed dredge footprint, with samples taken from the surface and to the proposed dredge depth. Samples were analysed for metals, organotins, THC, PAH and particle size analysis (PSA). The samples were recovered with a gravity corer and the corer penetrated to a point of refusal at each of the three sample locations.

The samples were recorded at the depths outlined in Table 12 below.

Table 12 Summary of sample depths

Sample	Core 1	Core 2	Core 3
Top (surface)	9.2m below LAT	7.5m below LAT	9.0m below LAT
Middle	9.8m below LAT	9.3m below LAT	9.8m below LAT
Bottom	10.5m below LAT	11.0 below LAT	10.8m below LAT

A summary of the sediment quality analysis is provided in Table 13 below.

Table 13 Summary of sediment quality data from the proposed dredge footprint for Inter Terminals Seal Sands Jetty 1 upgrade

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight)	Action Level 1 exceedance (no of samples)	Action Level 2 exceedance (no of samples)	TEL exceedance (no of samples)	PEL exceedance (no of samples)
Arsenic	19.9	31	Yes (8)	No (0)	Yes (9)	No (0)
Cadmium	0.35	1	Yes (6)	No (0)	Yes (2)	No (0)

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight)	Action Level 1 exceedance (no of samples)	Action Level 2 exceedance (no of samples)	TEL exceedance (no of samples)	PEL exceedance (no of samples)
Chromium	37.6	113	Yes (7)	No (0)	Yes (3)	No (0)
Copper	39.6	133	Yes (8)	No (0)	Yes (9)	Yes (2)
Mercury	0.35	1.27	Yes (9)	No (0)	Yes (9)	Yes (1)
Nickel	19.4	40.7	Yes (8)	No (0)	-	-
Lead	76	118	Yes (9)	No (0)	Yes (9)	Yes (3)
Zinc	112	191	Yes (8)	No (0)	Yes (8)	No (0)
Dibutyltin (DBT)	<LOD	0.024	No (0)	No (0)	-	-
Tributyltin (TBT)	<LOD	0.039	No (0)	No (0)	-	-
Acenaphthene	0.191	1.330	Yes (9)	-	Yes (9)	Yes (9)
Acenapthylene	0.123	1.000	Yes (9)	-	Yes (9)	Yes (8)
Anthracene	0.272	1.340	Yes (9)	-	Yes (9)	Yes (9)
Benz(a)anthracene	0.678	1.560	Yes (9)	-	Yes (9)	Yes (8)
Benzo(a)pyrene	0.615	1.410	Yes (9)	-	Yes (9)	Yes (8)
Benzo(b)fluoranthene	0.609	1.300	Yes (9)	-	-	-
Benzo(g,h,i)perylene	0.643	1.360	Yes (9)	-	-	-
Benzo(e)pyrene	0.631	1.400	Yes (9)	-	-	-
Benzo(k)fluoranthene	0.298	0.642	Yes (9)	-	-	-
C1-Napthalenes	4.090	19.600	Yes (9)	-	-	-
C1-Phenanthrenes	1.830	6.990	Yes (9)	-	-	-
C2-Napthalenes	3.650	15.900	Yes (9)	-	-	-
C3-Napthalenes	3.190	12.500	Yes (9)	-	-	-
Chrysene	0.745	2.030	Yes (9)	-	Yes (9)	Yes (8)
Dibenz(a,h)anthracene	0.119	0.234	Yes (9)	-	Yes (9)	Yes (8)
Fluoranthene	1.100	3.380	Yes (9)	-	Yes (9)	Yes (8)
Fluorene	0.356	2.440	Yes (9)	-	Yes (9)	Yes (9)
Indeno(123-cd)pyrene	0.460	0.842	Yes (9)	-	-	-
Napthalene	1.410	7.460	Yes (9)	-	Yes (9)	Yes (9)
Perylene	0.181	0.400	Yes (9)	-	-	-
Phenanthrene	1.450	5.610	Yes (9)	-	Yes (9)	Yes (9)
Pyrene	1.040	3.000	Yes (9)	-	Yes (9)	Yes (8)

As shown in Table 13, there are elevated concentrations of metals within the majority of samples. Where such elevations occur, they were marginally above Action Level 1 only, with no exceedances of Action Level

2. The majority of samples contained concentrations of metals in excess of the TEL. Concentrations of copper, mercury and lead were also present in excess of the PEL.

There is no obvious trend with regard to the concentrations of metals recovered at the surface and at depth; the concentrations of metals are generally very similar throughout the depth of each of the cores recovered.

The concentrations of organotins were all below Action Level 1. There are no TELs or PELs available for comparison for organotins.

All samples contained PAH in excess of Action Level 1. Exceedances ranged from relatively marginal to significantly in excess of Action Level 1 (particularly with regard to C1-Napthalenes, C2-Napthalenes and C3-Napthalenes). There is no Action Level 2 for PAH and therefore it is not possible to compare the data to Action Level 2. With regard to the majority of PAH compounds, there is a general trend of increasing concentration with depth through the sediment.

Where CSQG values have been identified, the majority of samples contained concentrations of PAH in excess of both the TEL and the PEL.

The MMO issued a marine licence for the disposal of dredged material to sea in June 2019, and therefore it is concluded that the MMO and Cefas had no concerns with the sediment quality data presented above.

7 Assessment of impacts in relation to designated sites

An assessment of potential effects of PDT's existing maintenance dredge regime on designated sites within the Tees has been undertaken. This is to determine that PDT is fulfilling its statutory obligations with regard to the Protocol, specifically to determine if the maintenance dredging activity is causing a significant effect on designated sites.

7.1 Teesmouth and Cleveland Coast SPA, pSPA and Ramsar site

Maintenance dredging has the potential to affect the Tees and Cleveland Coast SPA, pSPA and Ramsar site through the following:

- Changes to habitats as a result of hydrodynamic change leading to changes in the morphology of the estuary.
- Changes in water quality due to increased suspended sediments and redistribution of contaminated sediments. These sediments could potentially impact on the intertidal benthic organisms used by the waterbirds as a feeding resource.
- Deposition of suspended sediments leading to smothering of intertidal food resource of SPA features; particular the little tern and common tern which feeds on sandeels and small fish in the mouth of the estuary.
- Increased disturbance due to an increase in noise levels could impact on SPA interest features. This is of particular concern during the non-breeding period when waterbirds feed and gather energy and during breeding season.

7.1.1 Changes to morphology of the SPA habitat

Maintenance dredging in the Tees estuary has been undertaken at a relatively steady rate over the past 18 years, with similar target depths using similar plant. As such, the release of fine material and changes to morphology will have been at steady rates over this time period. The maintenance dredging on the Tees estuary is considered part of the existing overall estuary regime and is, therefore, reflected in the baseline conditions.

Maintenance dredging at Seaton Channel will form the main pathway for sediment transport to the existing SPA and Ramsar site at Seal Sands. Maintenance dredging campaigns have been relatively infrequent in this location, and when they occur are relatively small in terms of volume and timescale. It is therefore unlikely that maintenance dredging has had a significant effect on the already existing highly variable natural sediment processes (Royal Haskoning, 2006) and therefore impact on Seal Sands. Additionally, from studies undertaken to inform the EIA for NGCT, the timing of the dredging operation within the tidal cycle has the potential to both supply fine material onto Seal Sands or to preferentially export the material down Seaton Channel into the turning circle and/or to be dispersed further offshore. The sediment supply to Seal Sands associated with maintenance dredging in this area can therefore be altered depending on the desired effect. For example, a working agreement currently exists with Natural England whereby the Seaton Channel is dredged on a rising tide thus increasing, albeit intermittently, sediment supply to Seal Sands.

The only other potential effect of maintenance dredging is likely to be the dredging of material close to the side slopes of the seawards part of the approach channel. This could potentially cause destabilisation of these slopes and thus impact on the intertidal habitats of the SPA, pSPA and Ramsar site through collapse and therefore direct loss. The method of dredging adopted, however, limits the potential for this to occur. Two trenches are maintained on either side of the navigation channel at the toe of the side slopes to help trap material. It is from these areas, rather than the slopes, that material is removed as part of the

maintenance activities. This limits the potential for direct impact on the adjacent intertidal and therefore the habitat features of the SPA, pSPA and Ramsar site.

If maintenance dredging continues at similar rates as presently occurs, it can be reasonably assumed that the sediment regime will remain as it broadly is. Therefore, it is not believed that the current maintenance dredging regime has changed, or is likely to change, the morphology of the SPA, pSPA and Ramsar site.

The potential for the control of sediment pathways to Seal Sands has already been agreed with the regulator and Natural England and will be reviewed as necessary. A significant change from present dredging practice would however warrant a review of this conclusion because of the potential for those activities to represent a change from the present situation.

7.1.2 Changes in water quality

The potential effect on the SPA, pSPA and Ramsar interest features due to water quality relates to two issues. The first is the possible deterioration of water quality in relation to contamination re-suspended as a result of the dredging. The second is the potential impact of increased suspended sediment concentrations leading to increased turbidity of the water. Both issues could potentially cause a deterioration of water quality impacting on marine ecology resulting in impacts on waterbird feeding.

Maintenance dredging has the potential to cause re-suspension of contaminated sediment and subsequent deposition of contaminated sediment on intertidal areas of the SPA. Impacts to the marine ecology could lead to impacts on waterbird feeding activities.

The sediment quality data presented in Section 6.2 show that all sediment samples collected from within the footprint of the maintenance dredge activities are all within acceptable levels for disposal at sea, with the exception of sites within Billingham Reach Area which exceed action Cefas Action Level 2 resulting in an exclusion on disposal to at-sea disposal sites from material in the Billingham reach Area. However, subsequent re-sampling of Billingham Reach Area showed samples were below Action Level 2 and therefore it is envisaged the exclusion will be removed from the marine licence (Section 6.2.2).

Based on the results of the sediment quality data, there are no indirect impacts to waterbirds expected from the maintenance dredge activity as a result of re-suspension of contaminated sediments due to the low level of contaminants recorded (i.e. below Cefas Action Level 2). Additionally, since areas are continuously maintained, there is less risk associated with the build-up of contaminants.

Changes to background turbidity due to increased suspended sediment concentrations as a result of the maintenance dredging could potentially impact on food resources such as the sandeels used by terns. However, due to the predominant sediment type (sands) in the area in which the terns typically feed (less likely to have a high organic carbon content and therefore oxygen demand and settle out quickly due to larger grain size), an increase in suspended sediments is likely to be kept to a minimum. It is therefore unlikely that maintenance dredging will impact on the features on which the SPA, pSPA and Ramsar interest features rely on, and indirect impacts due to increased suspended sediments are not expected.

7.1.3 Deposition of suspended sediment

Maintenance dredging can lead to increased suspended sediment concentrations, which will disperse into the water column and subsequently deposit onto the seabed. This has the potential to impact benthic fauna, leading to potential indirect impacts to the SPA, pSPA and Ramsar interest features through changes to feeding resources.

An increase in suspended sediment concentrations can impact benthic fauna in a number of ways, including but not limited to reduced food resources due to reductions in light penetration, interference with feeding or respiratory apparatus and smothering following deposition.

As the benthic community is within an estuary, it will be adapted to fluctuating levels of suspended sediment concentrations that are typical in an estuarine environment. Additionally, due to the variation of dredge location throughout each year, increases in suspended sediment concentrations are not expected to cause significant impacts to benthic fauna. Therefore, indirect impacts to SPA, pSPA and Ramsar interest features are not expected.

7.1.4 Noise and visual disturbance

Noise above the general background baseline may cause disturbance to the SPA, pSPA and Ramsar site interest features. Additionally, the presence of vessels can also lead to a visual disturbance to the interest features.

Maintenance dredging in the Tees estuary has been undertaken at a relatively steady rate over the past 18 years in similar places using similar plant. As such, the noise generated from the maintenance dredging is considered part of the baseline conditions in the estuary for the SPA, pSPA and Ramsar site in relation to background noise levels.

If maintenance dredging continues at similar rates as presently occurs, it can be reasonably assumed that the baseline background noise for the SPA, pSPA and Ramsar site interest features will remain the same as it historically has during the period when dredging is being undertaken. Therefore, it is not believed that the current maintenance dredging regime causes a significant effect in relation to noise and visual disturbance. A significant change from present dredging practice would, however, warrant a review of this conclusion because of the potential for those activities to represent a change from the present situation

7.2 Teesmouth and Cleveland Coast SSSI

Potential effects on the waterbird features of the SSSI are covered within Section 7.1 above. The remaining features of relevance to the maintenance dredging activities are coastal habitats, specifically sand dunes and saltmarshes, and breeding harbour seals. These are considered below.

7.2.1 Saltmarsh and sand dunes

As stated in Section 7.1.1, there is potential for dredging to affect habitats directly through destabilisation to the side slopes of the seawards part of the approach channel, or indirectly through changes to natural sediment processes within the Tees.

Maintenance dredging in the Tees estuary has been undertaken at a relatively steady rate over the past 18 years, with similar target depths using similar plant. As such, the release of fine material and changes to morphology will have been at steady rates over this time period. Saltmarsh and sand dunes are not declining within the Tees (Natural England, 2018b), indicating that the ongoing maintenance dredging in the Tees has not been impacting these coastal habitats. If maintenance dredging continues at similar rates as presently occurs, it can be reasonably assumed that the sediment regime will remain as it broadly is and no impacts to saltmarsh and sand dune habitats are expected.

7.2.2 Harbour seals

Maintenance dredging has the potential to impact harbour seals through noise emitted during dredging practices (both underwater noise and airborne noise while seals are hauled out at haul out sites such as

Seal Sands and Greatham Creek). Additionally, the visual presence of the dredging vessel also has the potential to cause disturbance to harbour seals both within the estuary and at haul out sites.

The seals within the Tees are likely to be accustomed to a degree of noise disturbance from ongoing activities throughout the estuary. For example, the key haul out site for harbour seals is at Seal Sands directly adjacent to Seaton Port which has ongoing operations including construction and dredging operations. Monitoring has shown that the number of seals present in Tees and utilising the haul out sites are steadily increasing, indicating that the port operations have not discouraged breeding seals from utilising the haul out sites within the Tees.

Maintenance dredging in the Tees estuary has been undertaken at a relatively steady rate over the past 18 years in similar places using similar plant. As such, the noise generated from the maintenance dredging is considered part of the baseline conditions in the estuary in relation to background noise levels.

If maintenance dredging continues at similar rates as presently occurs, it can be reasonably assumed that the baseline background noise will remain the same. Therefore, it is not believed that the current maintenance dredging regime causes a significant impact in relation to noise and visual disturbance. A significant change from present dredging practice, would however, warrant a review of this conclusion because of the potential for this to represent a change from the present situation.

7.3 Conclusions

The existing maintenance dredging activity being undertaken in the study area does not appear to be having, or has historically had, an impact on the existing designated sites. If existing practices are continued, maintenance dredging activities will not affect the current and proposed designated sites, as the maintenance dredging forms a long-established part of the overall existing estuary regime.

A significant change from present dredging practice would, however, warrant a review of this conclusion because of the potential for this to represent a change from the present situation.

8 Changes to previous recommendations

The assessment of potential effects of maintenance dredging on the Teesmouth and Cleveland Coast SPA and Ramsar site was originally presented in Section 5 of the Baseline Document (Royal Haskoning, 2008). Due to the new Teesmouth and Cleveland Coast SSSI, pSPA and Ramsar site, further impact assessment has been undertaken to assess the potential effects on the existing and proposed designated sites using the most recent maintenance dredging information and sediment quality data.

The 2008 Baseline Document concluded that the existing maintenance dredging activity being undertaken in the study area does not appear to be having, or has historically had, an impact on the designated site which would alter its condition. No mitigation measures were relied on within 2008 Baseline Document to come to the conclusions made.

The updated impact assessment indicates the conclusions reached in the 2008 Baseline document remain valid. Additionally, the maintenance dredging is part of the existing estuary regime and is therefore considered part of the baseline environment.

The 2008 Baseline Document recommended that these conclusions must be reviewed if a significant change in maintenance dredging practices should occur as a result of new developments. There have been no changes to dredging and disposal practices since production of the 2017 Baseline Document update, and there have been no significant proposed developments which have received consent and have been implemented during 2018 which could impact on the ongoing maintenance dredge practices.

In addition to the above, it is concluded that the outcomes of the WFD compliance assessment conducted in the 2017 baseline update remain valid, based on the results of the sediment contamination surveys conducted within the Tees (Royal HaskoningDHV, 2018). The WFD compliance assessment concluded that maintenance dredging is not causing a reduction in status or jeopardising the WFD water bodies screened into the assessment from meeting their objectives.

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Appendix 1

Dredge areas and volumes

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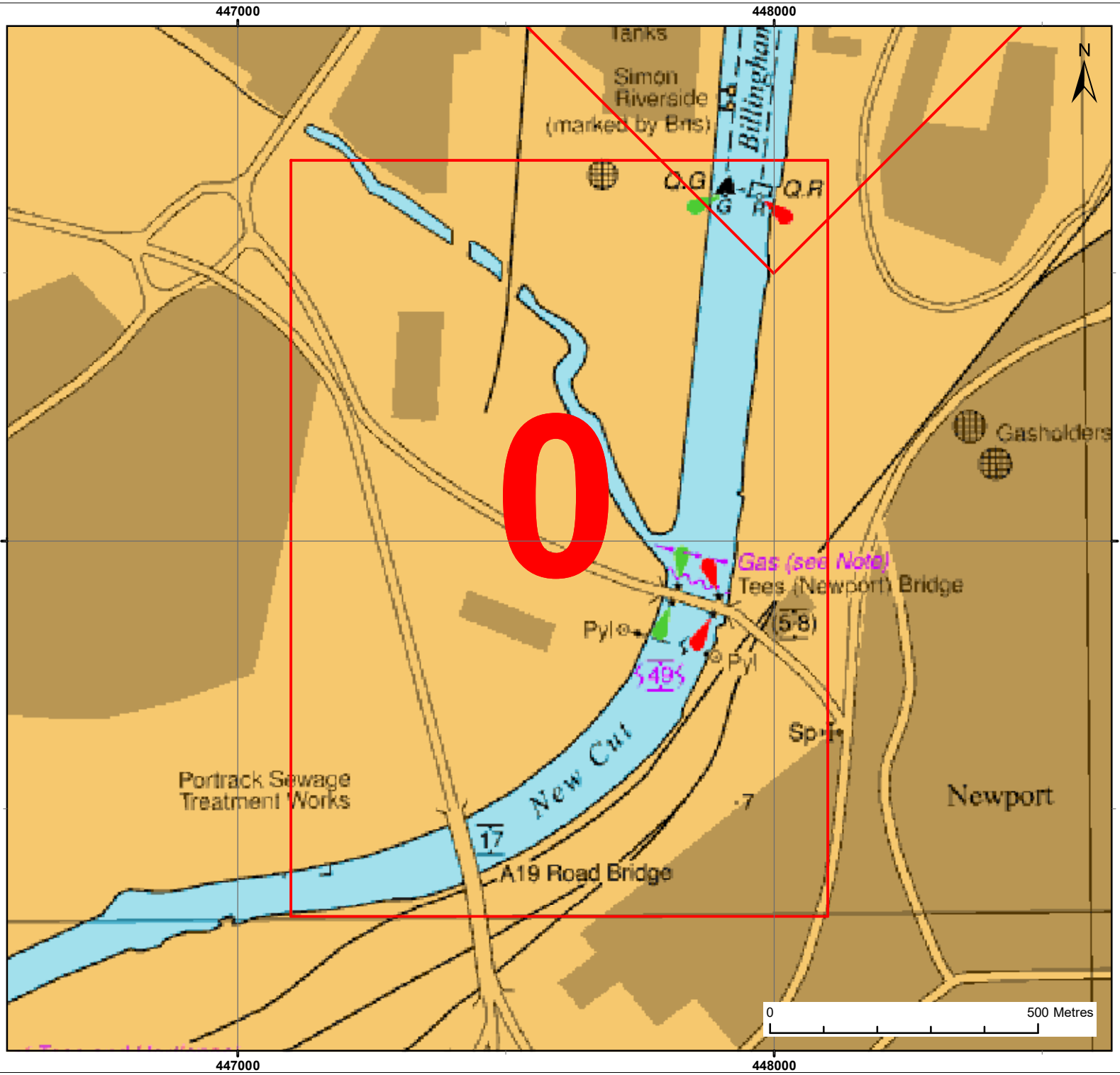

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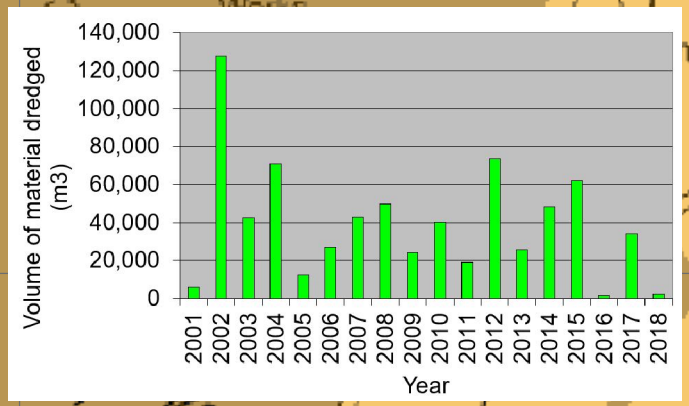

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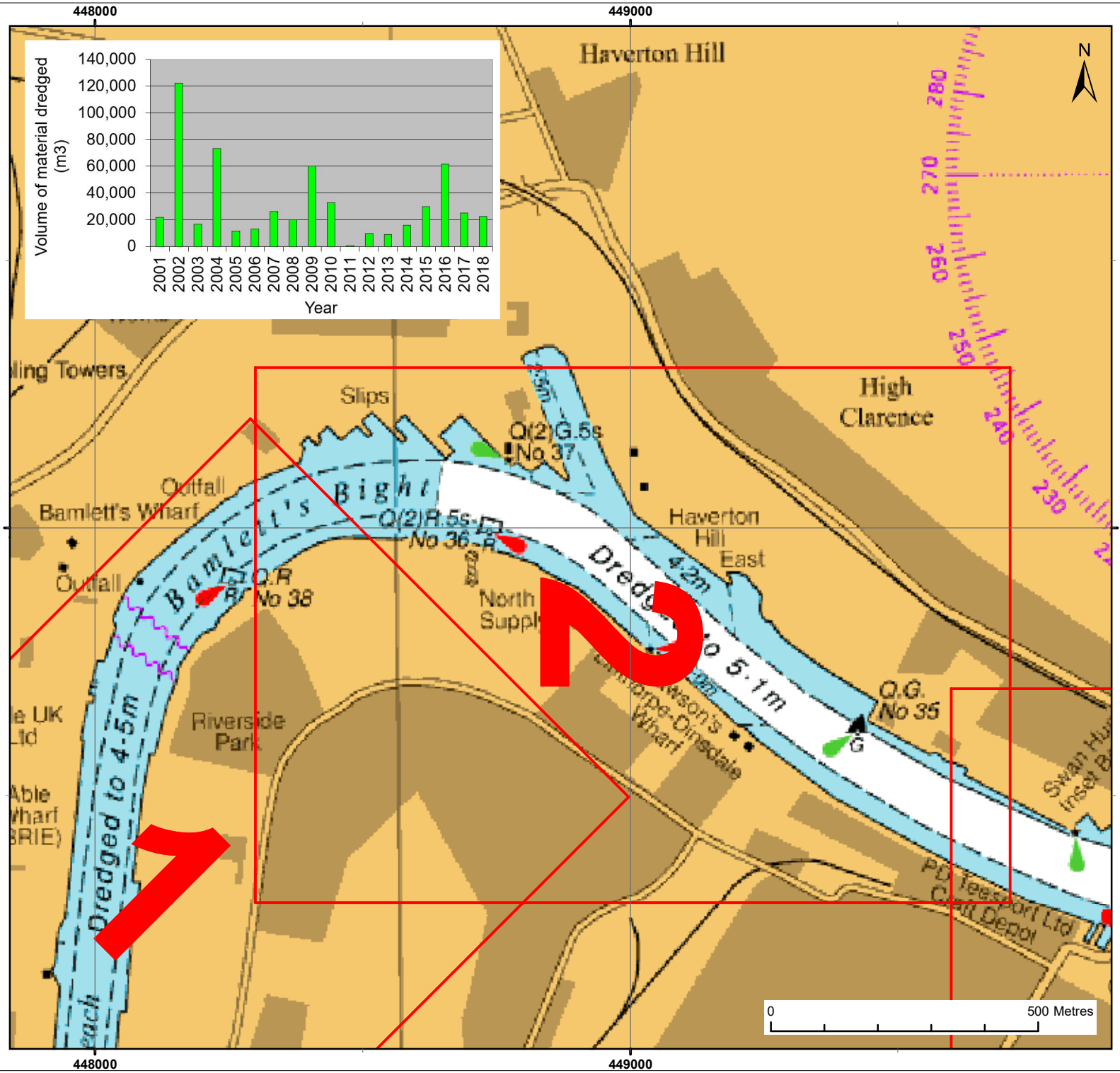

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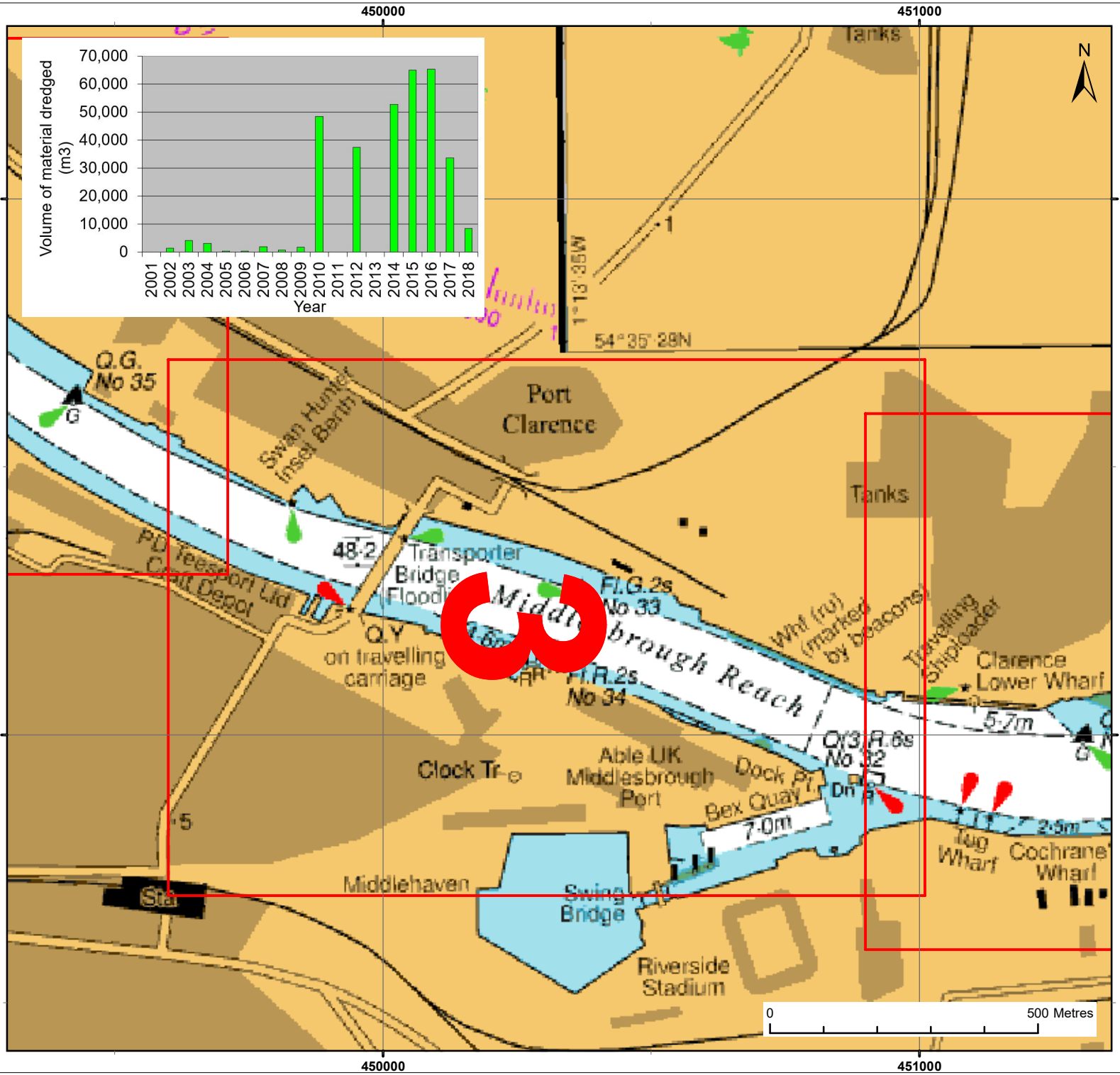

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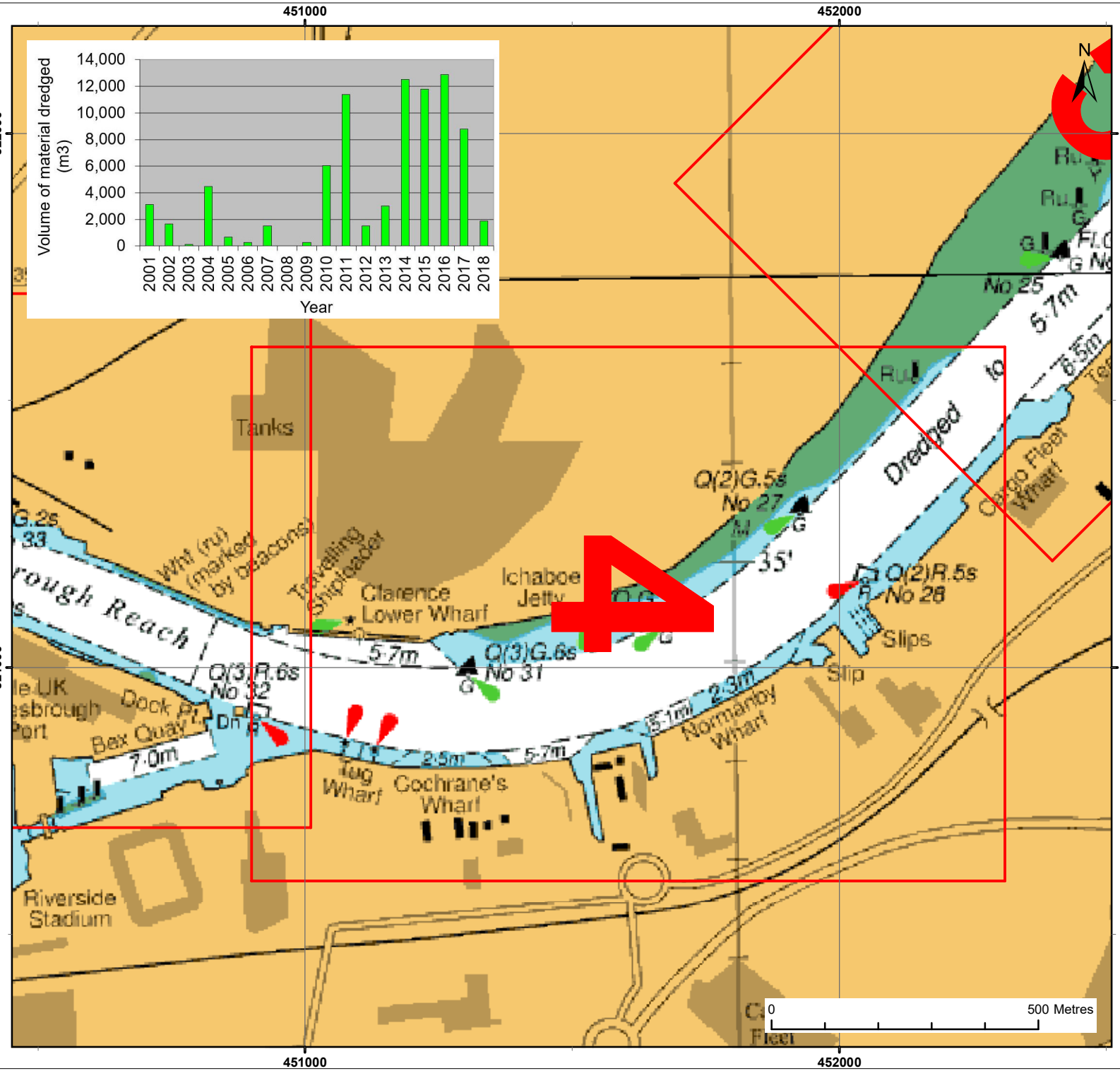

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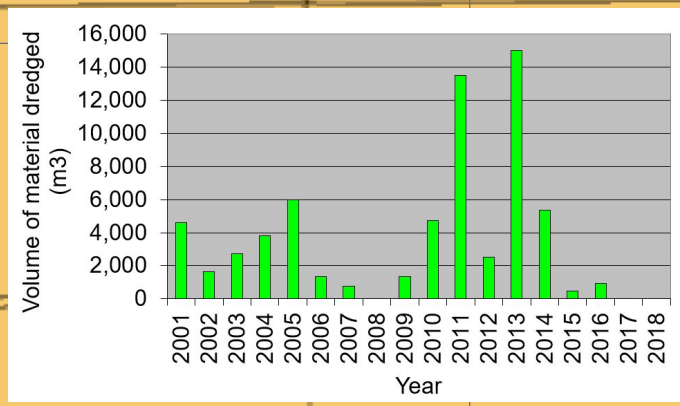

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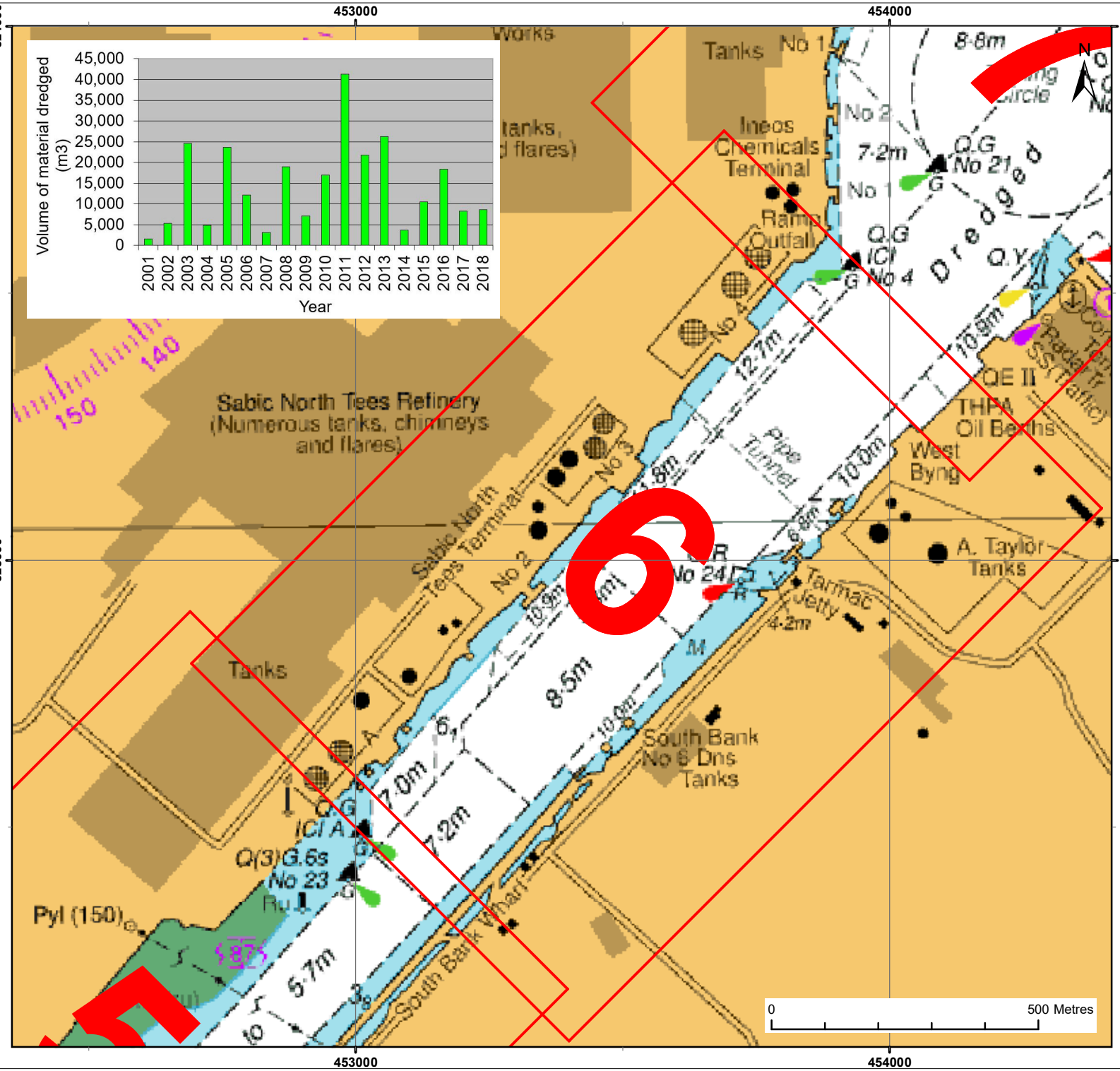

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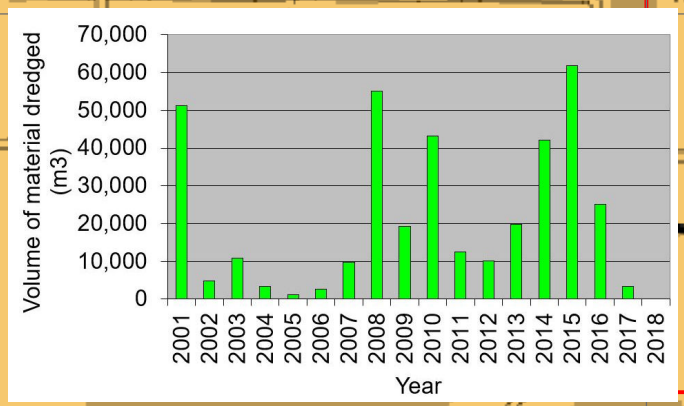

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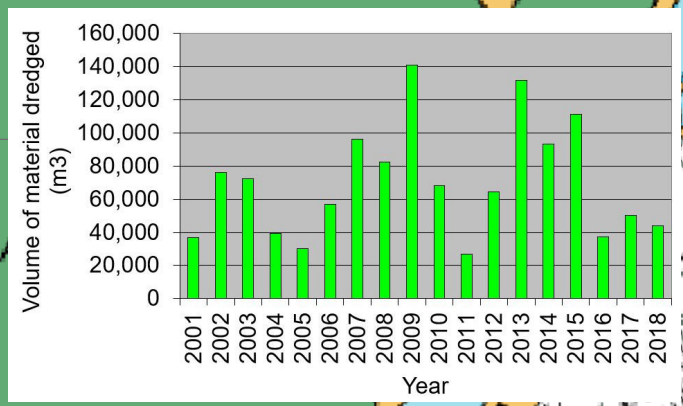

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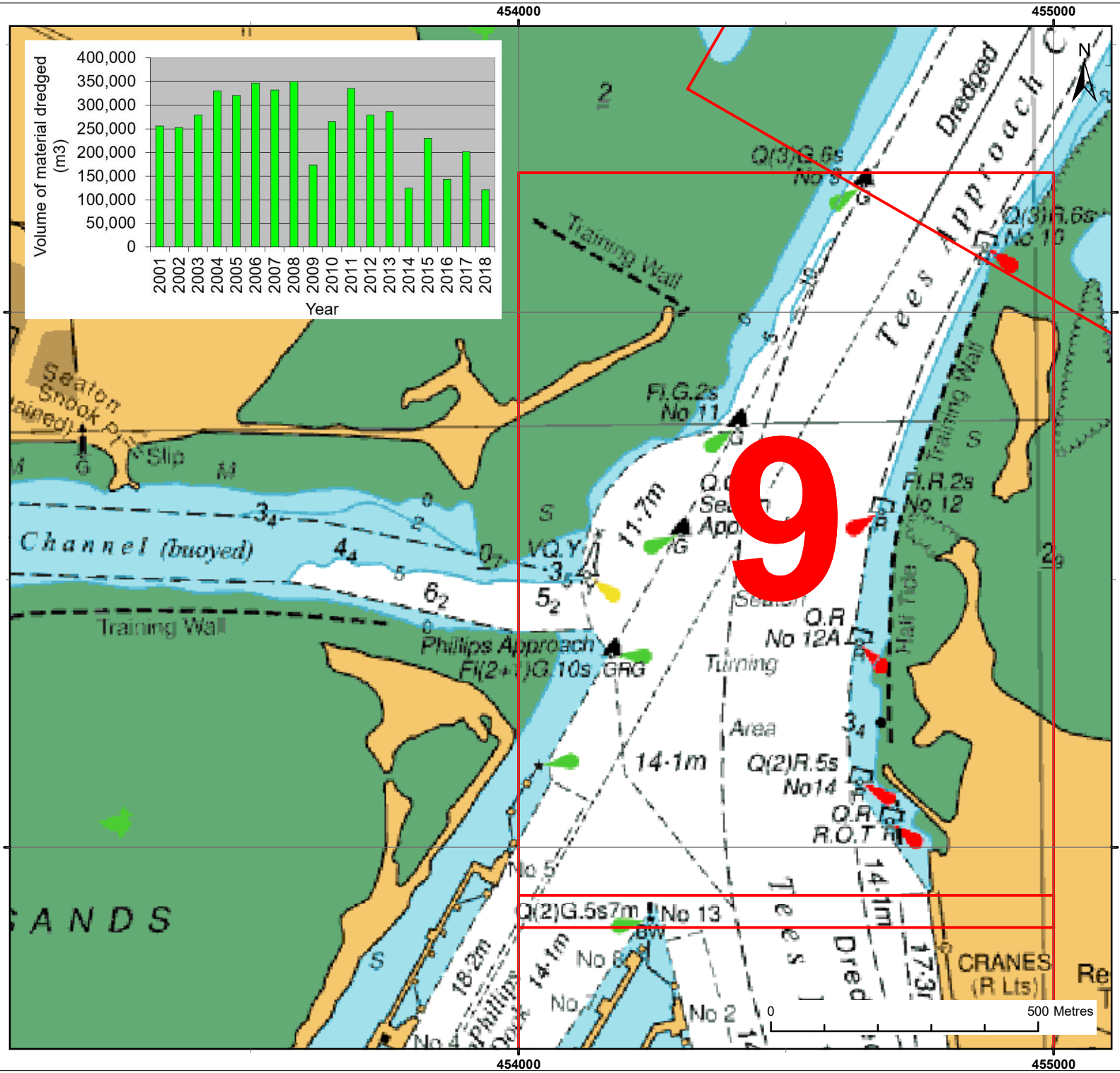

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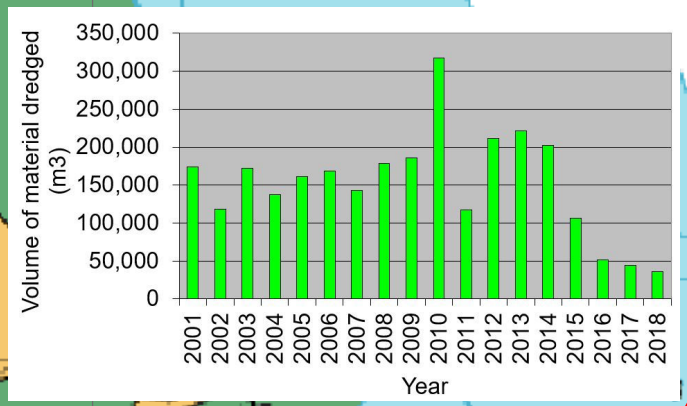

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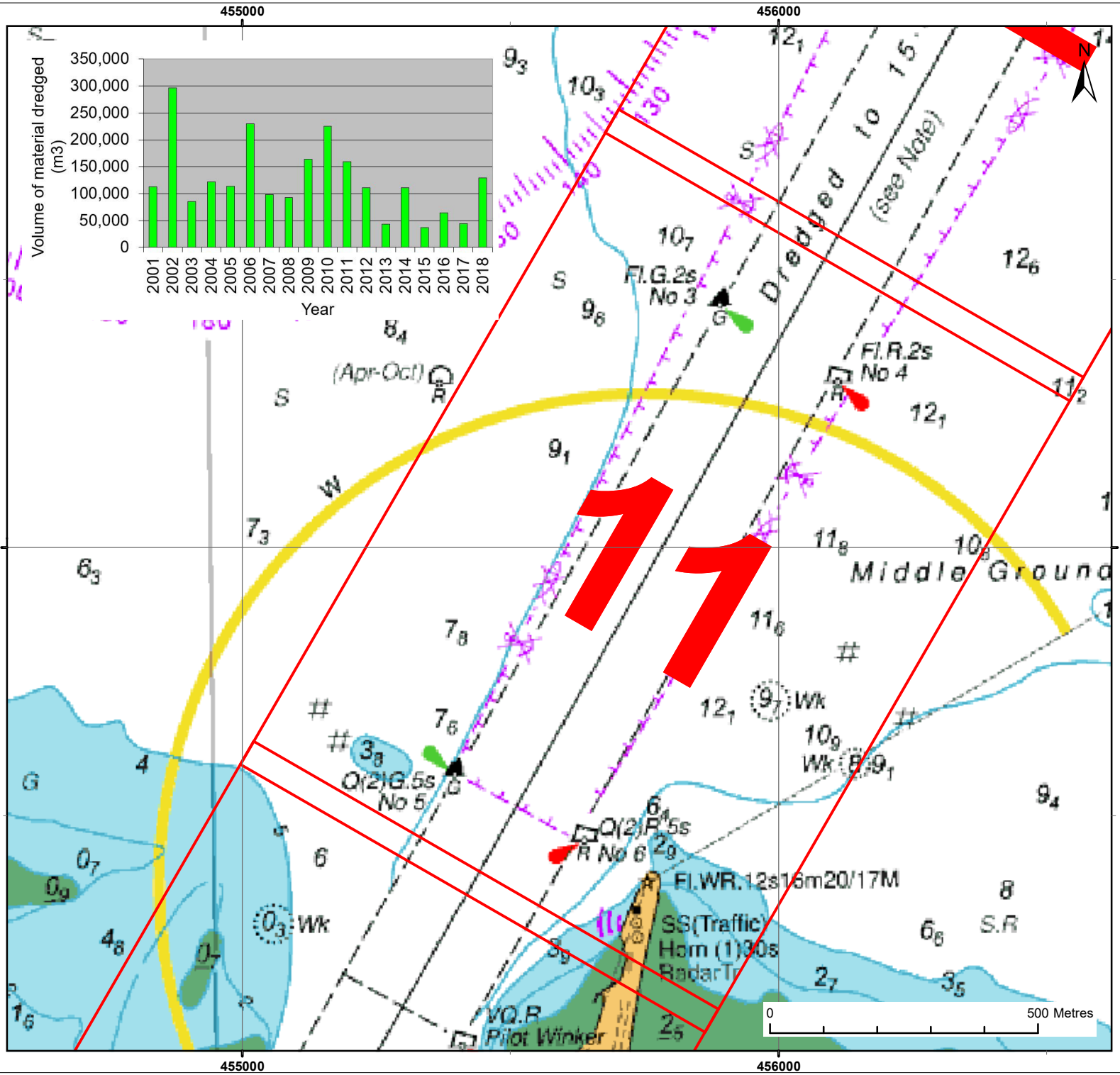

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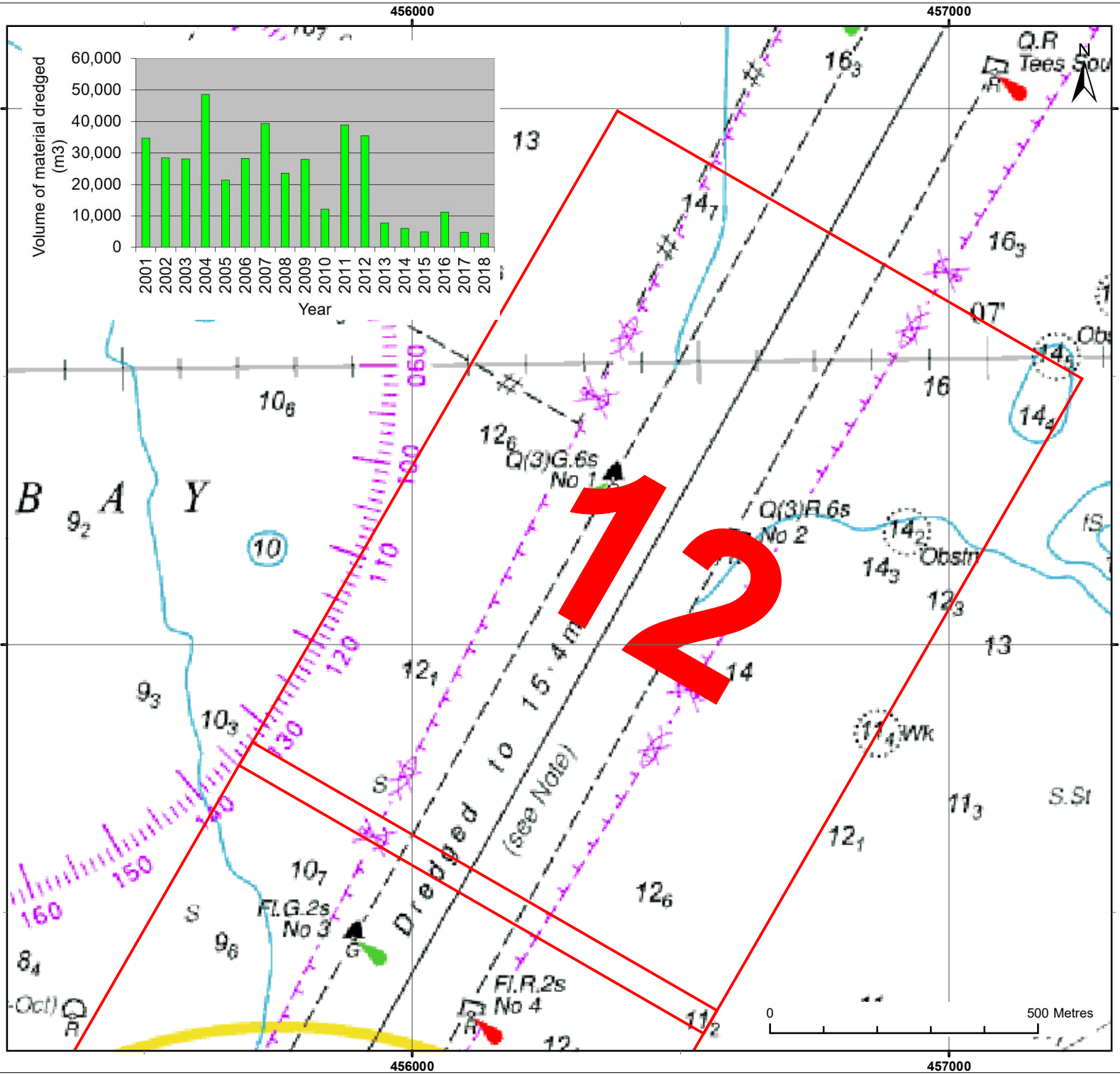

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