

CAPABILITY
& PORTFOLIO
2021



Marine Aggregates

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National overview

Why are marine aggregates important to Britain?

Britain has one of the world's most developed marine aggregate industries, extracting 15 to 20 million tonnes from the seabed annually. Much of this is used for building houses, transport infrastructure, replenishing beaches and improving coastal defences. It currently meets more than 20% of the sand and gravel demand in England and Wales.

The Crown Estate owns almost all of the sand and gravel resources lying off of the coast of England, Wales and Northern Ireland and we award and manage commercial agreements for companies to extract it.

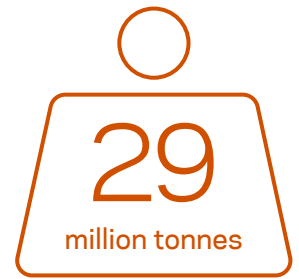
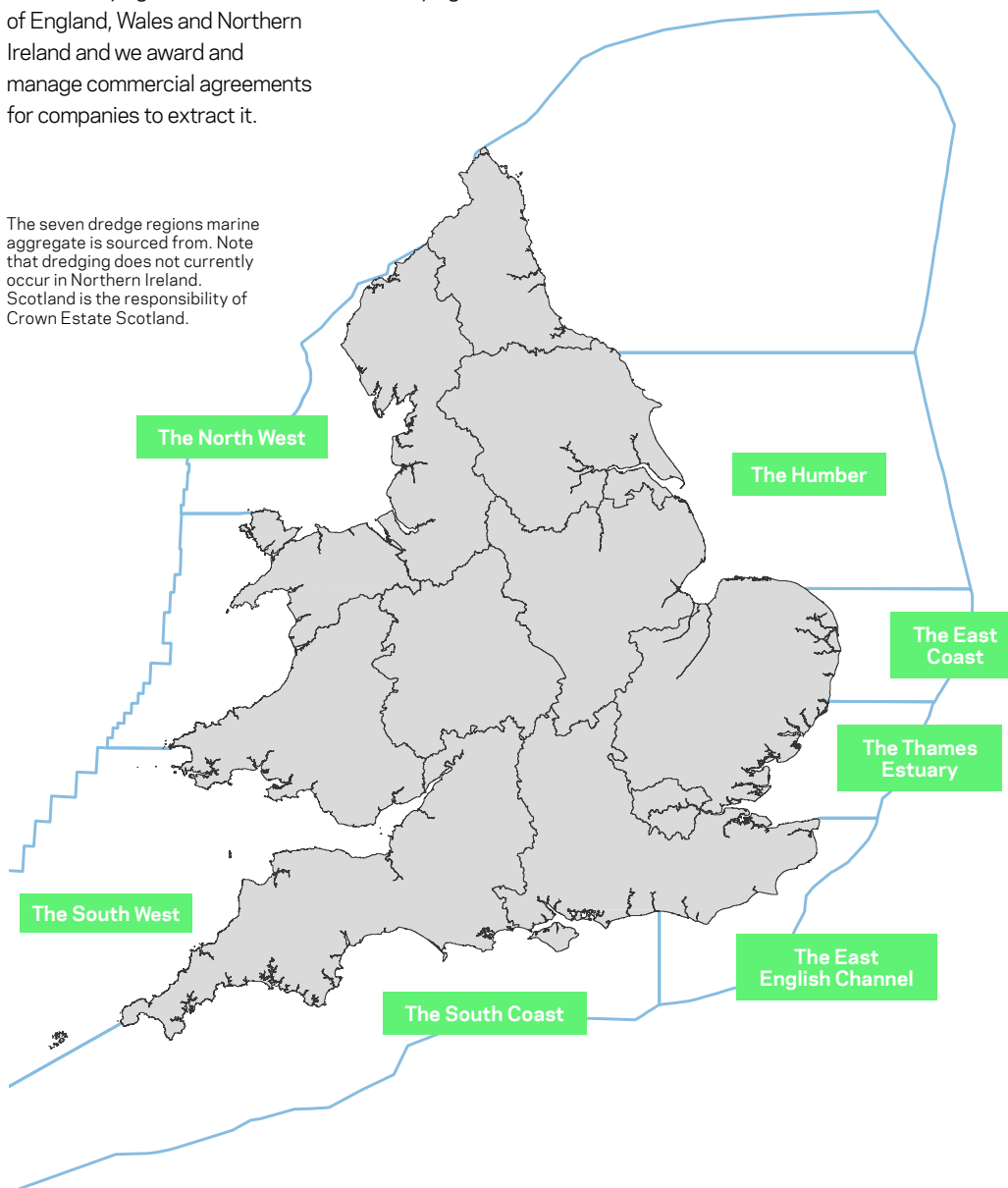
The seven dredge regions marine aggregate is sourced from. Note that dredging does not currently occur in Northern Ireland. Scotland is the responsibility of Crown Estate Scotland.

Although the quantity of sand and gravel potentially available from marine sources is vast, we are aware that it is ultimately a finite natural mineral resource and are keen to ensure that these valuable, nationally strategic, minerals are used in the most sustainable manner possible.

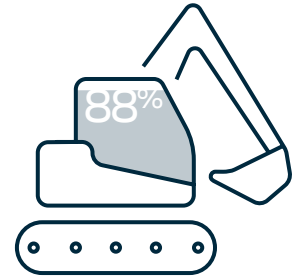
This document is designed to help planning officers in local authorities understand the contribution that marine aggregates can make, by identifying offshore sources and

providing information on supply routes. In turn, this is intended to support local authorities in complying with the National Planning Policy Framework, which requires mineral planning authorities to demonstrate they have a steady and adequate supply of aggregates for their requirements through Local Aggregates Assessments.

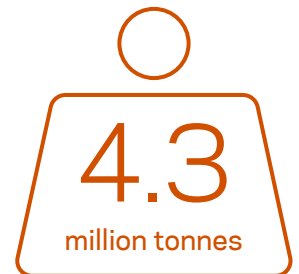
Unless otherwise stated, all figures in this document are correct as of July 2021.



There is potential for demand to increase to **29 million tonnes per year by 2030**



88% of marine aggregates landed in England and Wales are used by the **building industry**



4.3 million tonnes of marine aggregate were exported to **Europe** in 2020 (**24%** of all marine aggregate landed)

Sustainability and stewardship

The Crown Estate is committed to responsible management of the seabed, which includes minimising the impact that marine aggregate dredging has on the natural environment.

We work in partnership with industry, regulators and stakeholders to improve the sustainability of the sector.

Via our Electronic Monitoring System, we ensure all dredging is undertaken in the correct locations, and every licence application must be supported by a full Environmental Impact Assessment including a Coastal Impact Study to determine whether a marine licence (essentially the planning consent) can be granted, a process governed by the Marine Licensing process.



To deliver 8,500 tonnes takes:

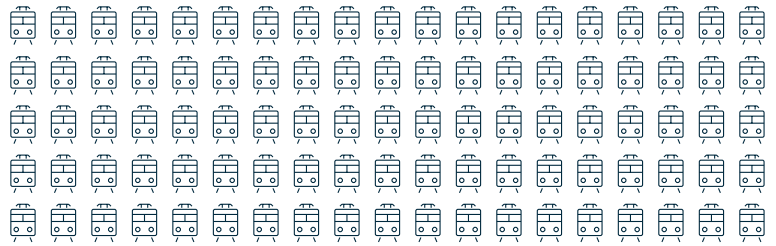
1 dredger

(of 8,500 tonnes)



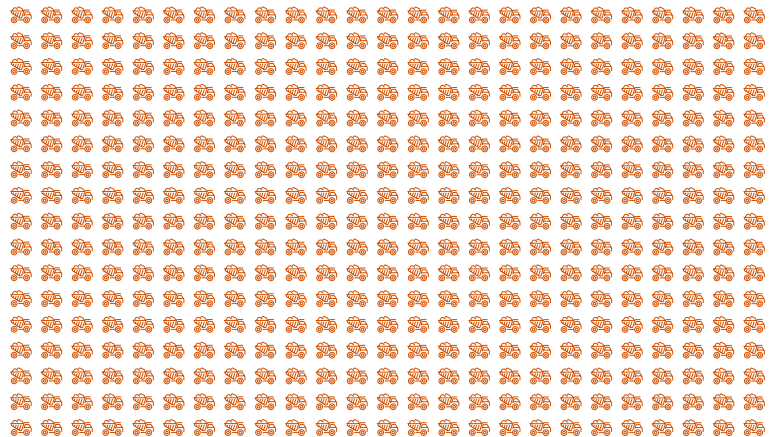
95

train hopper wagons
(of 90 tonnes)



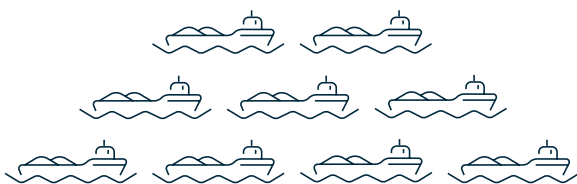
425

aggregate lorries
(of 20 tonnes)



9 barges

(of 1,000 tonnes)



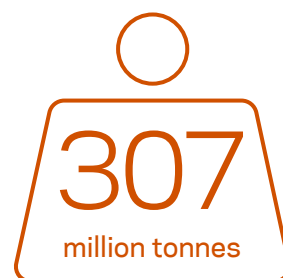
Reserves and resources

Reserves and Resources

The PERC code defines “reserves” as the proportion of a mineral “resource” that can be mined for economic purposes

19

Current national estimates suggest there are **19 years** of primary marine aggregate production permitted

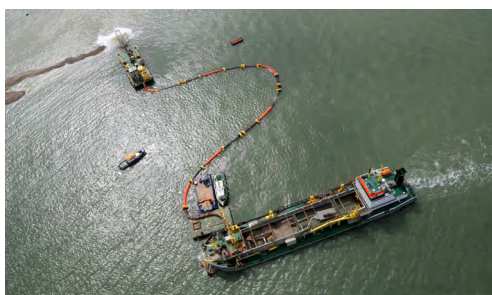
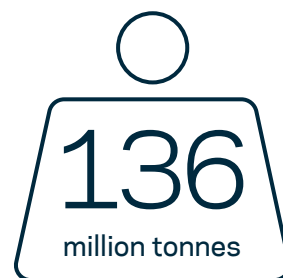


307
million tonnes

Estimated national total current primary reserves

Region	Total current primary reserves	10-year average annual offtake*	3-year average annual offtake*	Peak annual offtake during 10-year period*	Annual permitted offtake (as July 2021)	Regional reserve life at 10-year average annual offtake
Humber	46.17	2.11	3.27	3.52	6.98	21.90
East Coast	48.95	4.21	3.73	5.28	7.08	11.64
Thames Estuary	30.78	1.28	1.48	1.94	3.80	24.03
East English Channel	56.52	3.96	4.15	4.65	9.17	14.27
South Coast	79.73	3.38	3.32	3.92	7.83	23.60
South West	34.64	1.18	1.31	1.38	2.75	29.46
North West	9.81	0.28	0.22	0.38	1.10	35.16
Total	306.60	16.39	17.47	18.10	38.71	18.71

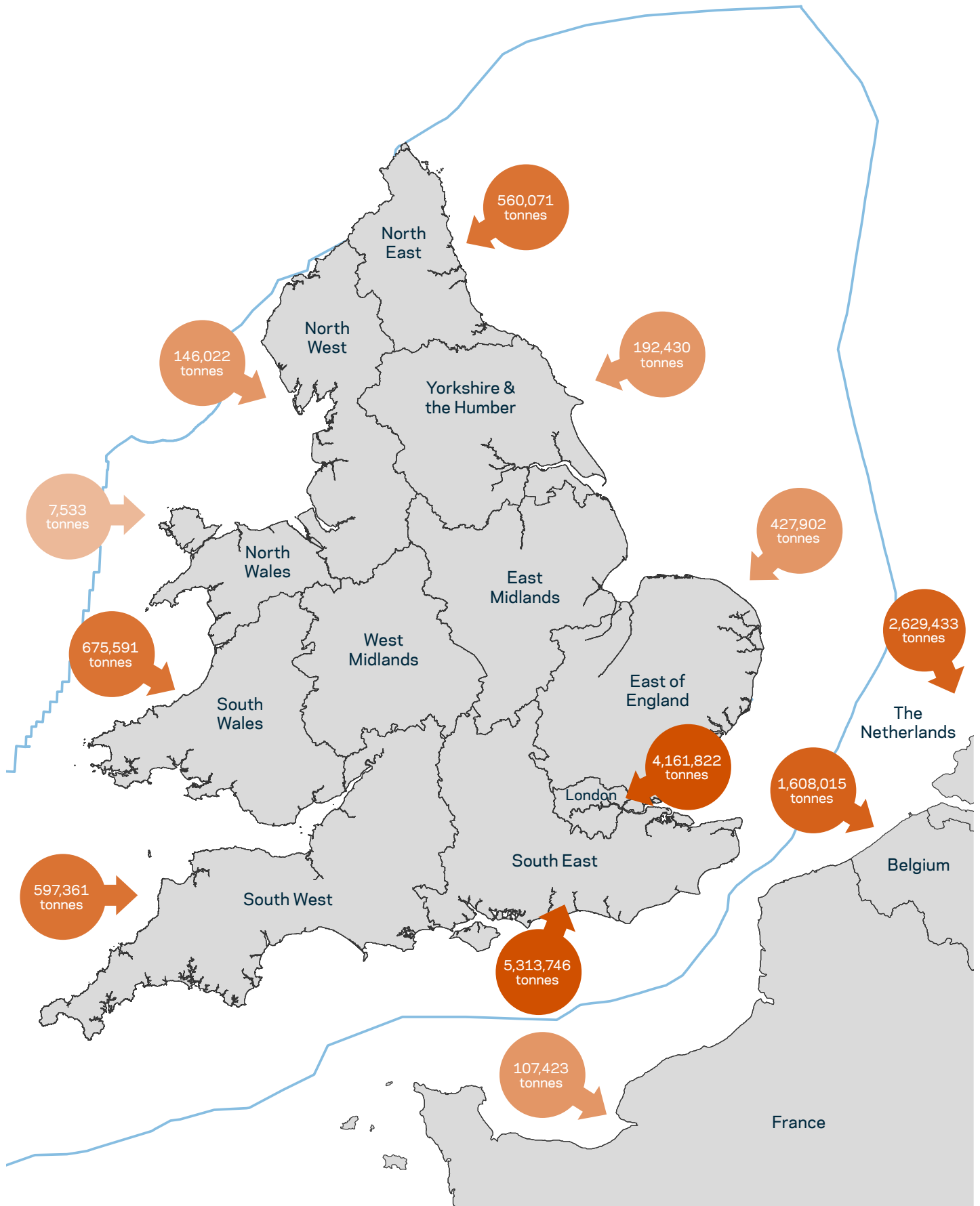
All figures are in millions of tonnes
*Totals are national averages and peaks, not the sum of regional figures

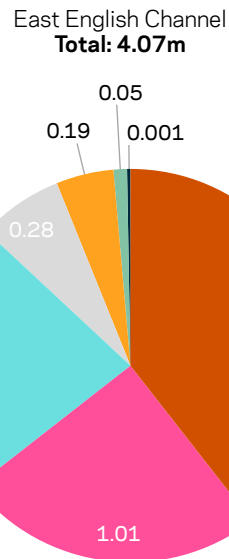
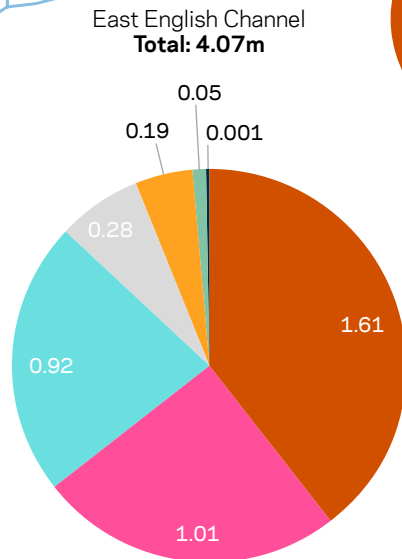
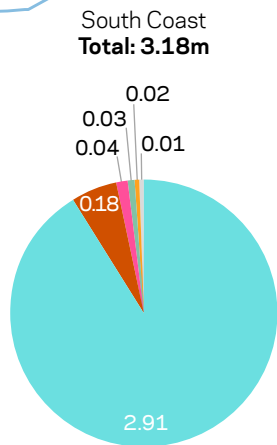
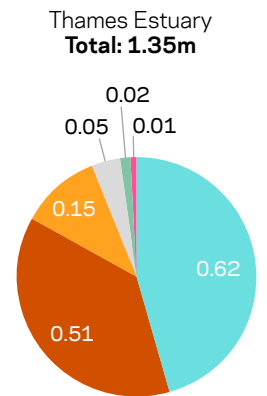
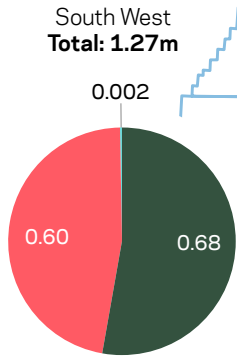
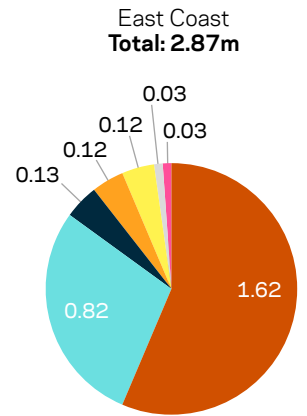
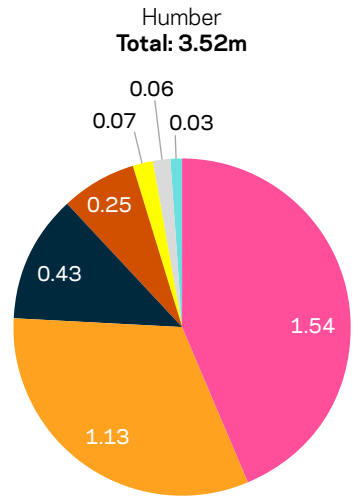
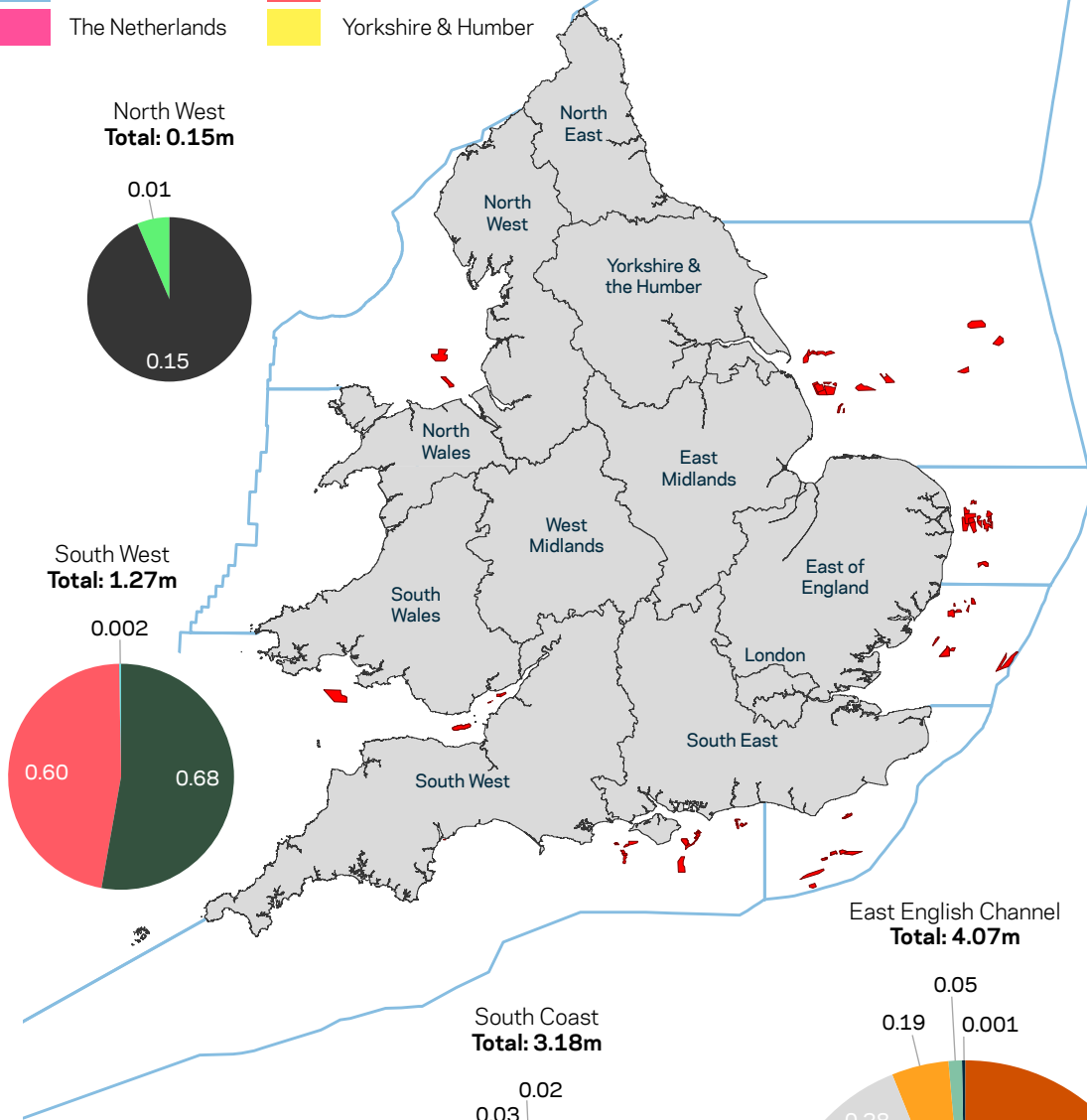
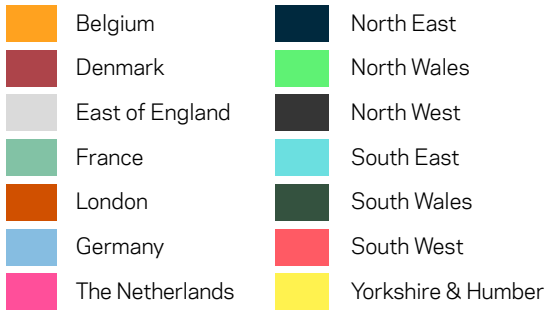
136
million tonnes

London and the Thames Estuary are supplied by the East Coast, Thames Estuary & East English Channel. These hold reserves of 136m tonnes, giving **London** and the **Thames Estuary** 14 years of production

Delivery by region / country



Extraction and delivery by dredge region



The Humber region

6.98

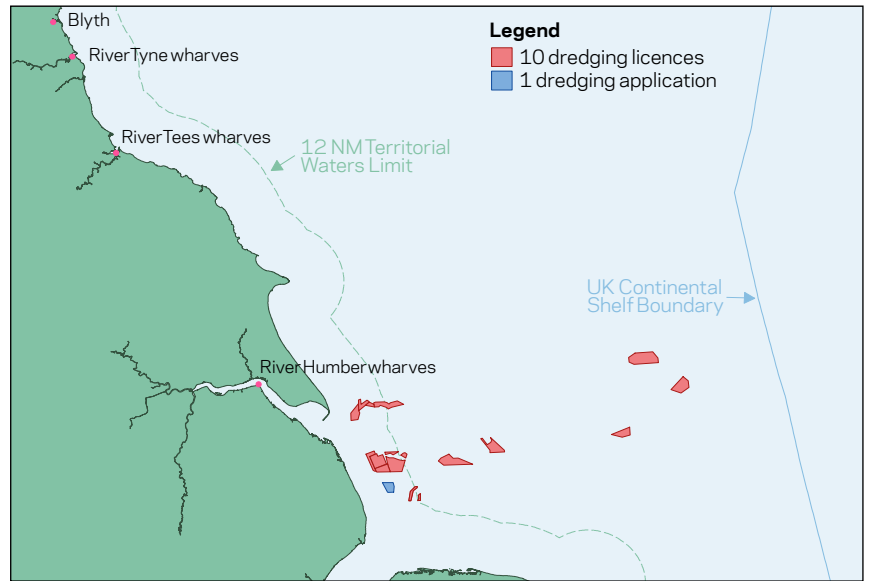
million tonnes can be extracted from 10 licences annually

22

Current estimates suggest there are 22 years of primary marine aggregate production permitted

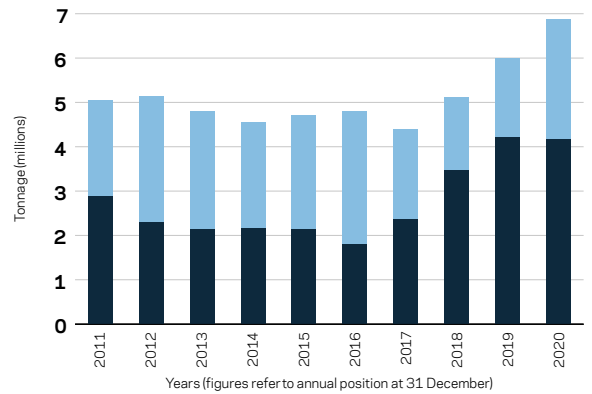
1

application for a licence could, if approved, increase the permitted tonnage by 0.5 million tonnes



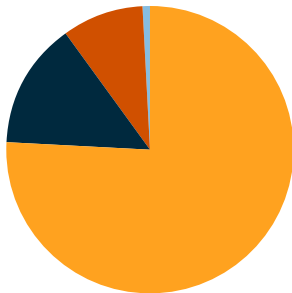
Permitted and extracted tonnage

■ Unused permitted tonnage
 ■ Extracted tonnage



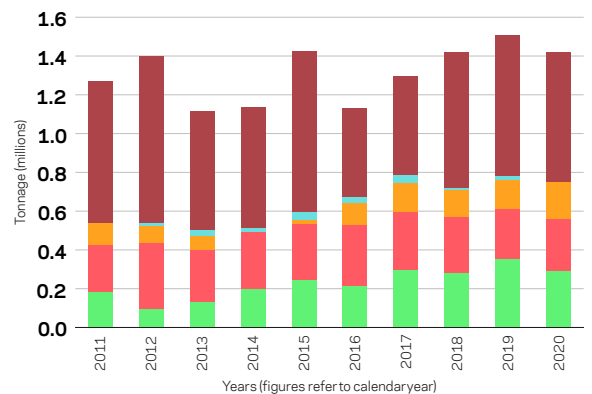
During 2020 material extracted from the region was delivered to:

- Mainland Europe (75.9%)
- Humber (including North East) (14.3%)
- Thames Estuary (9%)
- East Coast (0.8%)



Delivery of marine aggregate to the region

■ Secondary use from licences
 ■ Blyth
 ■ River Humber wharves
 ■ River Tyne wharves
 ■ River Tees wharves



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm



Medium gravel
20 - 40mm



Coarse gravel
40 - 63mm

The East Coast region

7.08

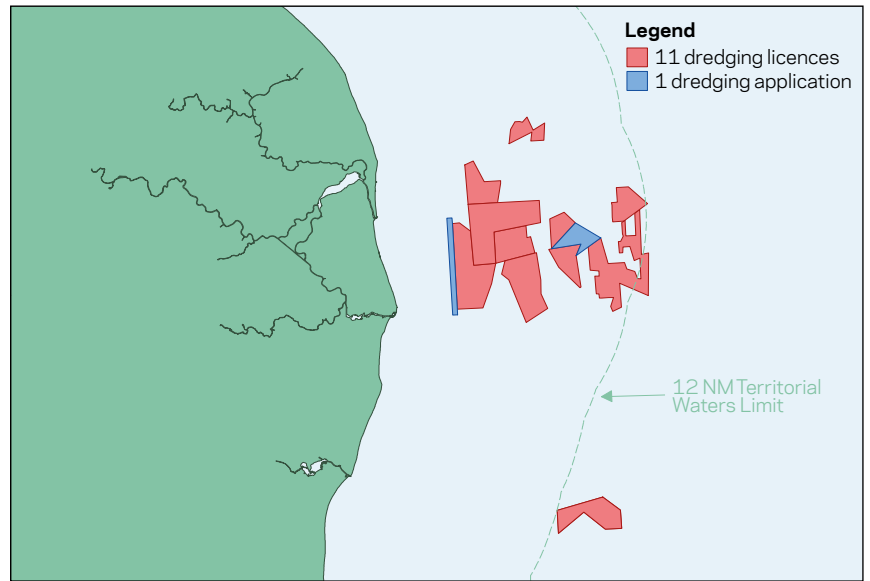
million tonnes can be extracted from 11 licences annually

12

Current estimates suggest there are 12 years of primary marine aggregate production permitted

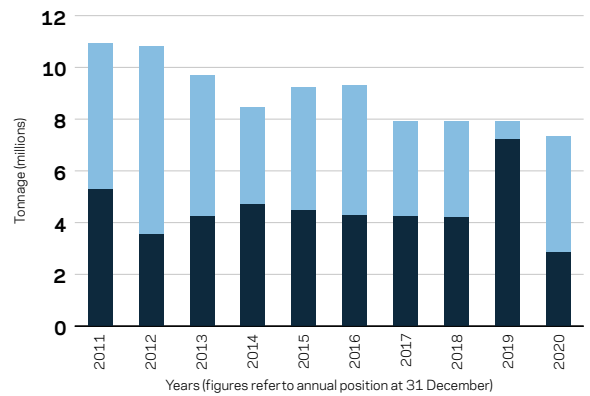
1

application for licences could, if approved, increase the permitted tonnage by 0.65 million tonnes



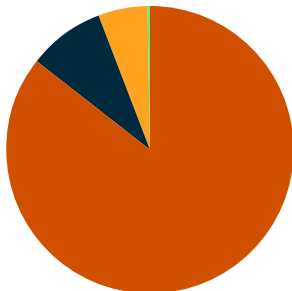
Permitted and extracted tonnage

■ Unused permitted tonnage
 ■ Extracted tonnage



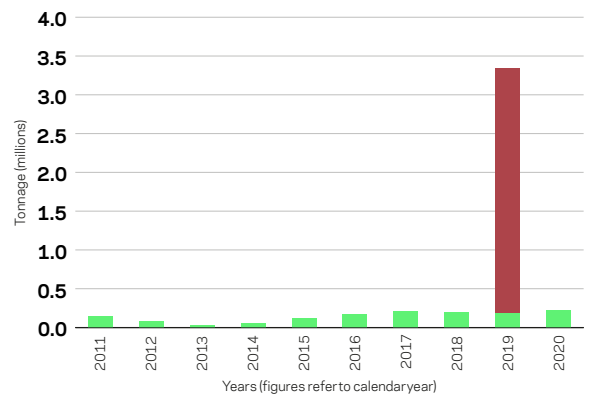
During 2020 material extracted from the region was delivered to:

- Thames Estuary (85.7%)
- Humber (including North East) (8.6%)
- Mainland Europe (5.4%)
- South Coast (0.3%)



Delivery of marine aggregate to the region

■ Secondary use from licences
 ■ Ipswich



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm



Medium gravel
20 - 40mm



Coarse gravel
40 - 63mm

The Thames region

3.80

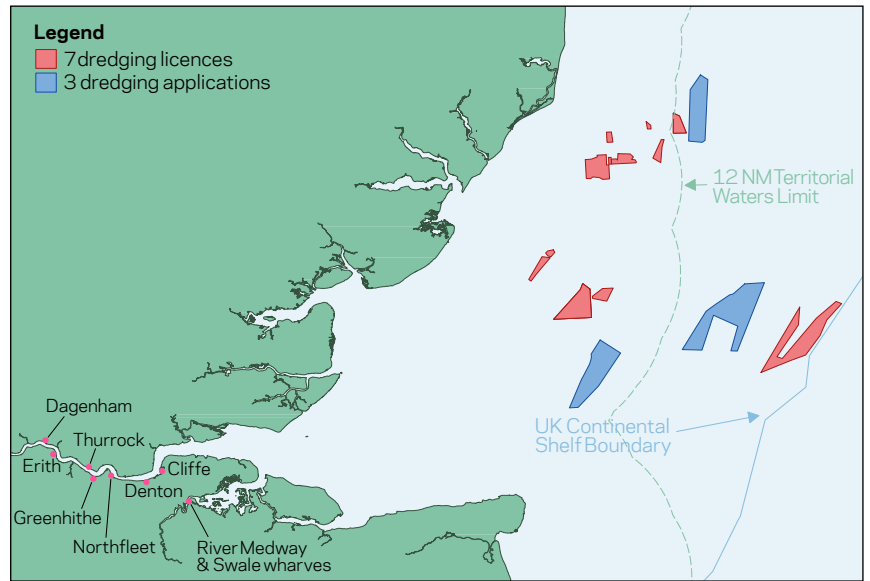
million tonnes can be extracted from 7 licences annually

24

Current estimates suggest there are 24 years of primary marine aggregate production permitted

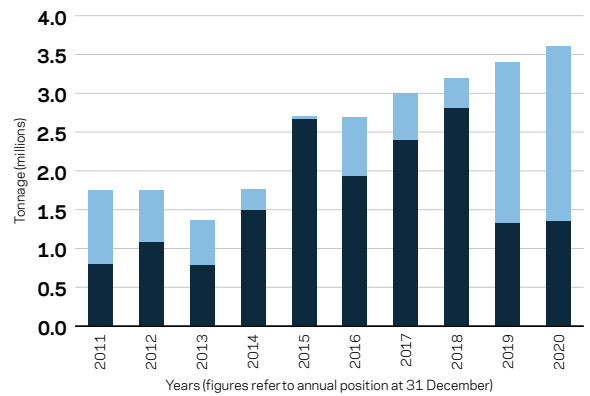
3

applications for licences could, if approved, increase the permitted tonnage by 1.85 million tonnes



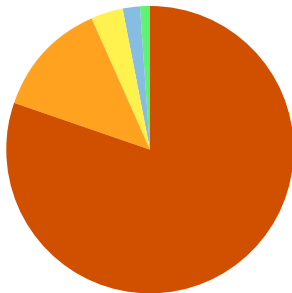
Permitted and extracted tonnage

- Unused permitted tonnage
- Extracted tonnage



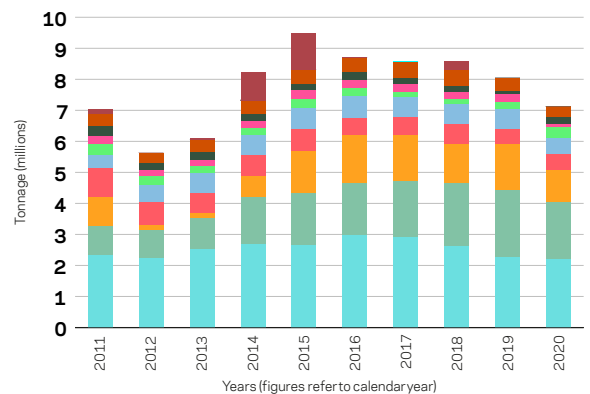
During 2020 material extracted from the region was delivered to:

- Thames Estuary (80.4%)
- Mainland Europe (13.1%)
- East English Channel (3.8%)
- East Coast (1.7%)
- South Coast (1.1%)



Delivery of marine aggregate to the region

- Secondary use from licences
- Tilbury
- Isle of Grain
- River Medway & Swale wharves
- Thurrock
- Erith
- Greenhithe
- Denton
- Northfleet
- Cliffe
- Dagenham
- Greenwich wharves



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm



Medium gravel
20 - 40mm



Coarse gravel
40 - 63mm

The East English Channel region

9.17

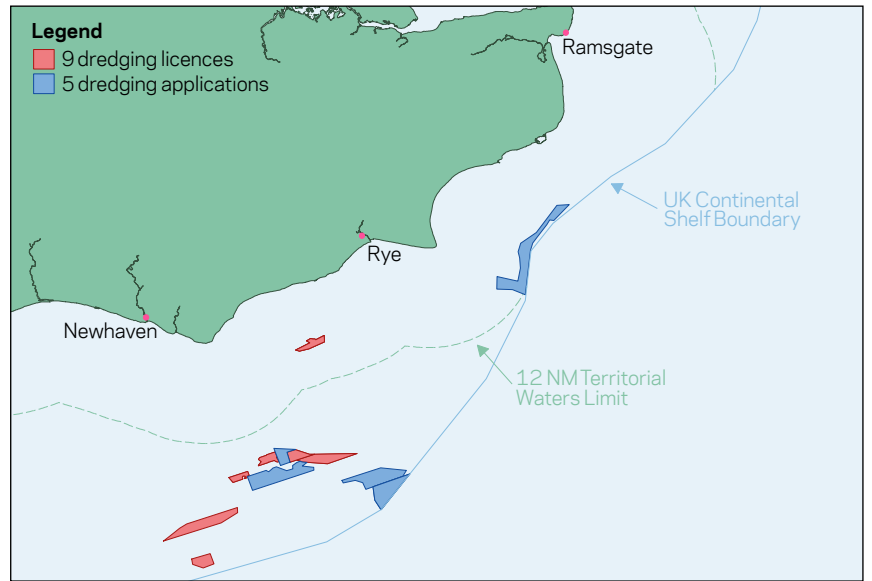
million tonnes can be extracted from 9 licences annually

14

Current estimates suggest there are 14 years of primary marine aggregate production permitted

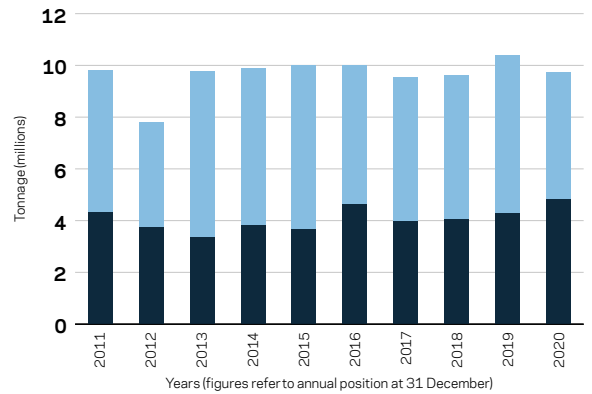
5

applications for licences could, if approved, increase the permitted tonnage by 4.1 million tonnes



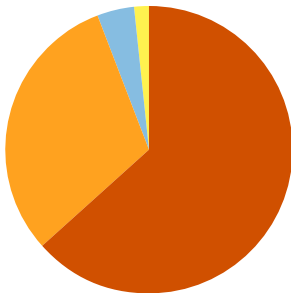
Permitted and extracted tonnage

Unused permitted tonnage
Extracted tonnage



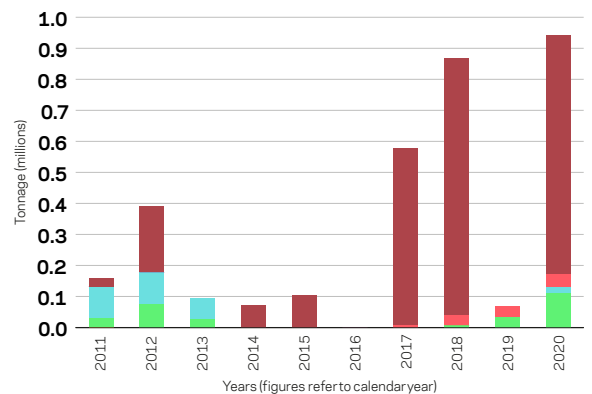
During 2020 material extracted from the region was delivered to:

- Thames Estuary (63.4%)
- Mainland Europe (30.9%)
- East Coast (4%)
- East English Channel (1.6%)
- Humber (including North East) (<0.1%)



Delivery of marine aggregate to the region

Secondary use from licences
Ramsgate
Dover
Newhaven
Rye



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm



Medium gravel
20 - 40mm



Coarse gravel
40 - 63mm

The South Coast region

7.83

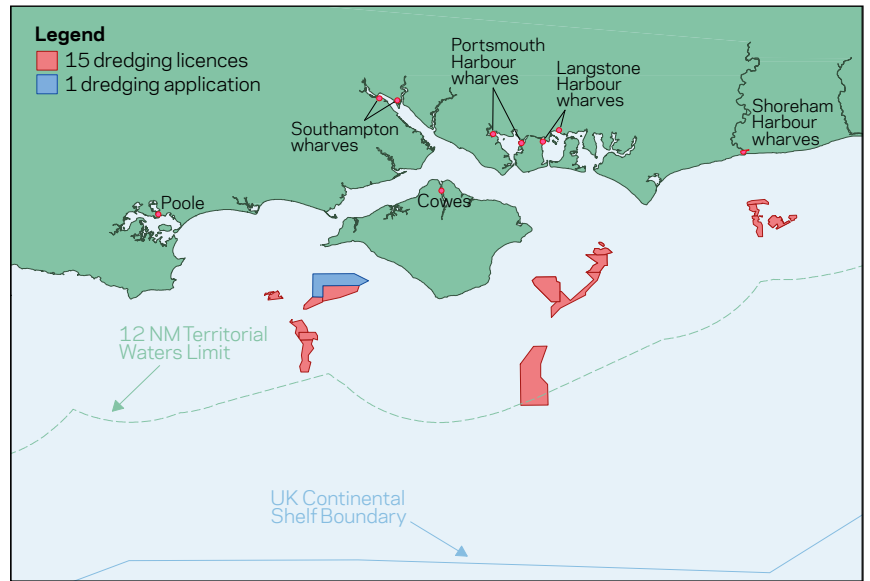
million tonnes can be extracted from 15 licences annually

24

Current estimates suggest there are 24 years of primary marine aggregate production permitted

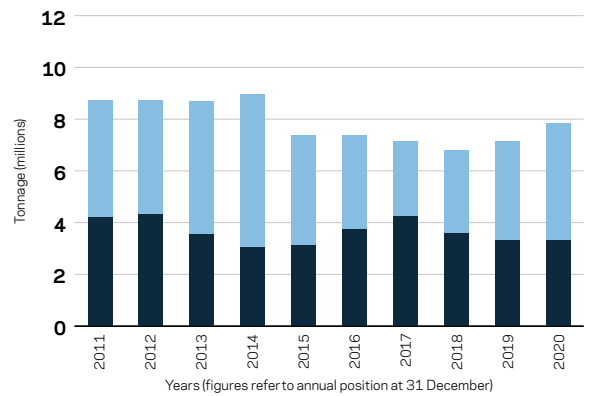
1

application for a licence could, if approved, increase the permitted tonnage by 0.3 million tonnes



Permitted and extracted tonnage

Unused permitted tonnage
Extracted tonnage



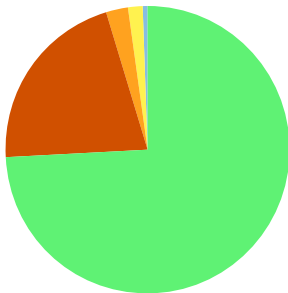
Delivery of marine aggregate to the region

Secondary use from licences
Littlehampton
Poole
Cowes
Portsmouth Harbour wharves
Langstone Harbour wharves
Southampton wharves
Shoreham Harbour wharves



During 2020 material extracted from the region was delivered to:

South Coast (74.4%)
Thames Estuary (21.1%)
Mainland Europe (2.5%)
East English Channel (1.7%)
East Coast (0.3%)



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm



Medium gravel
20 - 40mm



Coarse gravel
40 - 63mm

The South West region

2.75

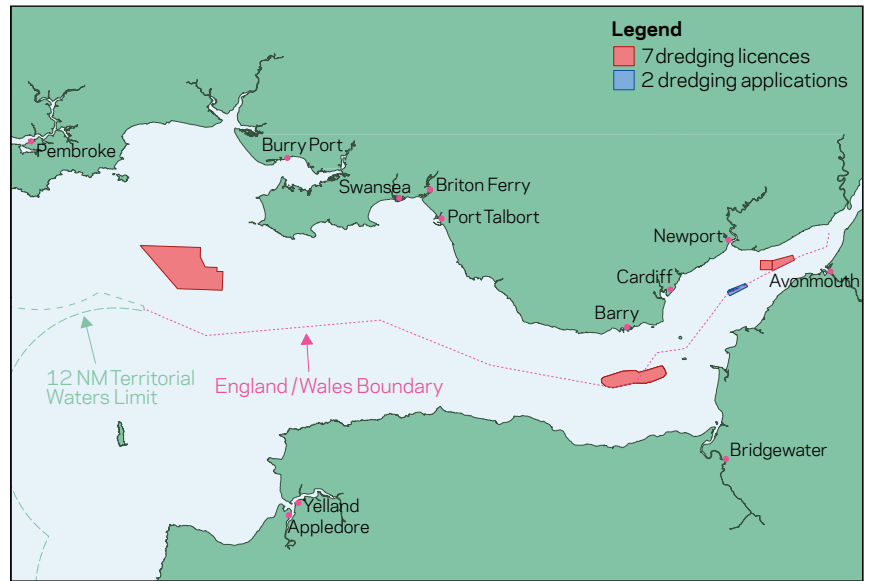
million tonnes can be extracted from 7 licences annually

29

Current estimates suggest there are 29 years of primary marine aggregate production permitted

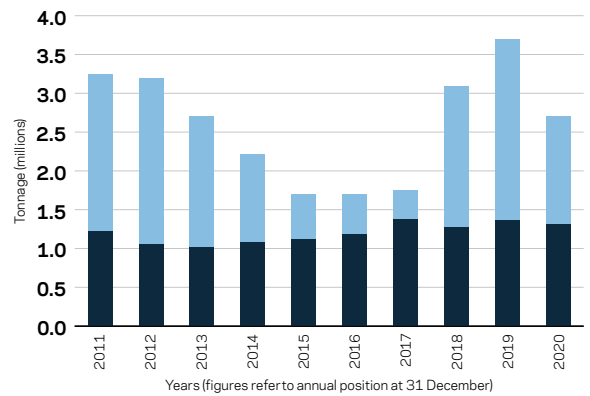
2

applications for licences could, if approved, increase the permitted tonnage by 0.05 million tonnes



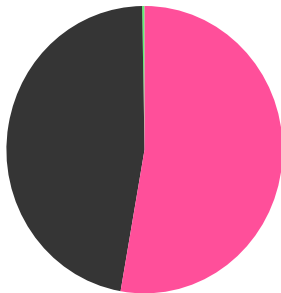
Permitted and extracted tonnage

- Unused permitted tonnage
- Extracted tonnage



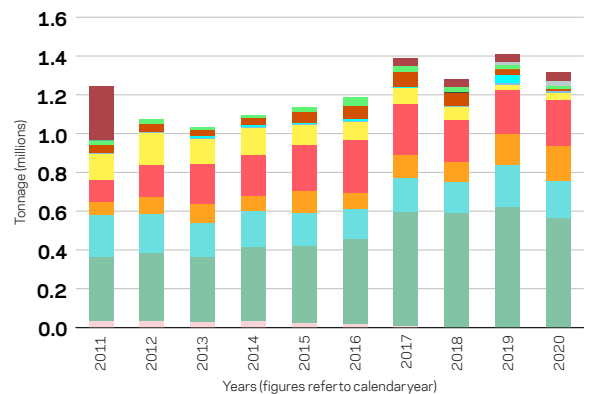
During 2020 material extracted from the region was delivered to:

- South West - Welsh wharves (53%)
- South West - English wharves (46.9%)
- South Coast (<0.2%)



Delivery of marine aggregate to the region

- Secondary use from licences
- Hinkley
- Pembroke
- Briton Ferry
- Bridgewater
- Yelland
- Port Talbot
- Swansea
- Newport (Wales)
- Bury Port
- Cardiff
- Avonmouth
- Appledore



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm



Medium gravel
20 - 40mm



Coarse gravel
40 - 63mm

The North West region

1.10

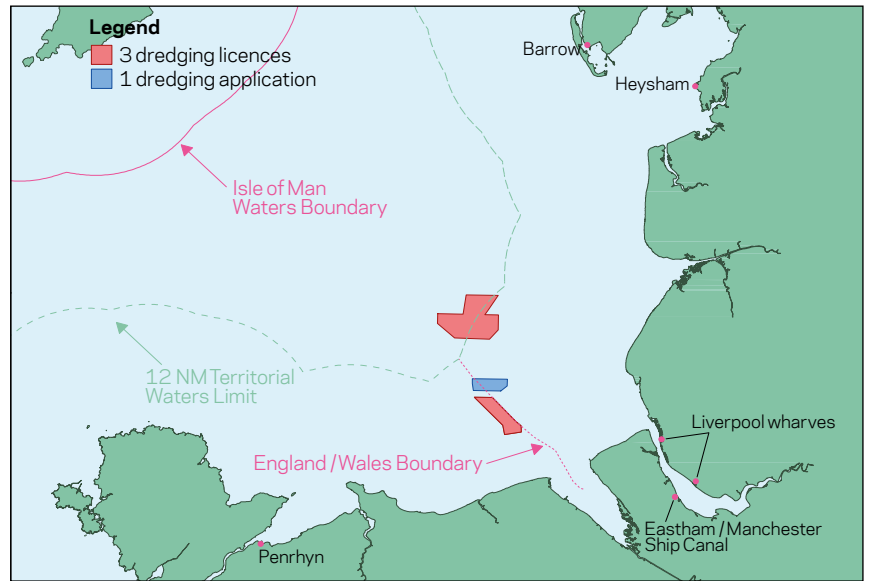
million tonnes can be extracted from 3 licences annually

35

Current estimates suggest there are 35 years of primary marine aggregate production permitted

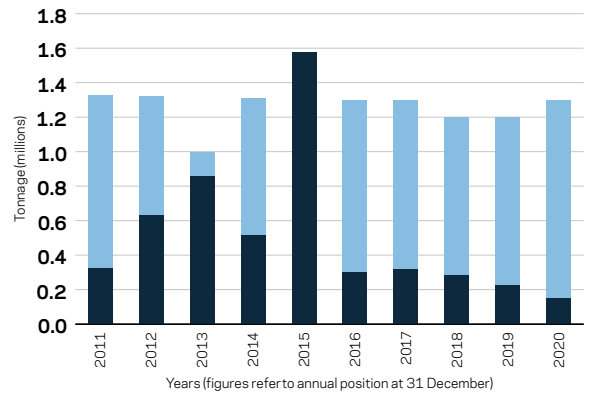
1

application for a licence could, if approved, increase the permitted tonnage by 0.5 million tonnes



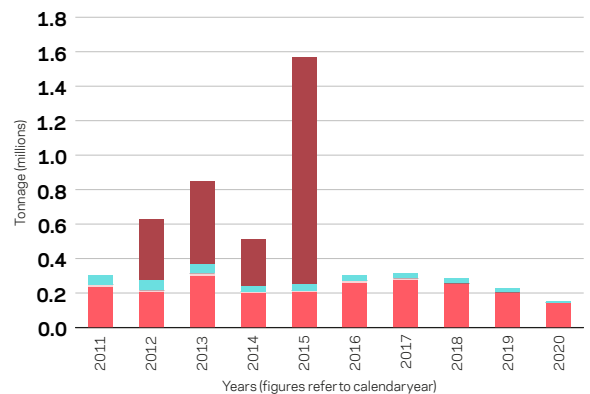
Permitted and extracted tonnage

- Unused permitted tonnage
- Extracted tonnage



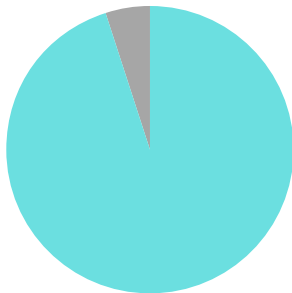
Delivery of marine aggregate to the region

- Secondary use from licences
- Penrhyn
- Barrow
- Liverpool wharves



During 2020 material extracted from the region was delivered to:

- North West - English wharves (95.1%)
- North West - Welsh wharves (4.9%)



Sediment and indicative grain sizes



Fine sand
0.063 - 0.25mm



Medium sand
0.25 - 0.5mm



Coarse sand
0.5 - 2mm



Very coarse sand
2 - 4mm



Fine gravel
4 - 20mm

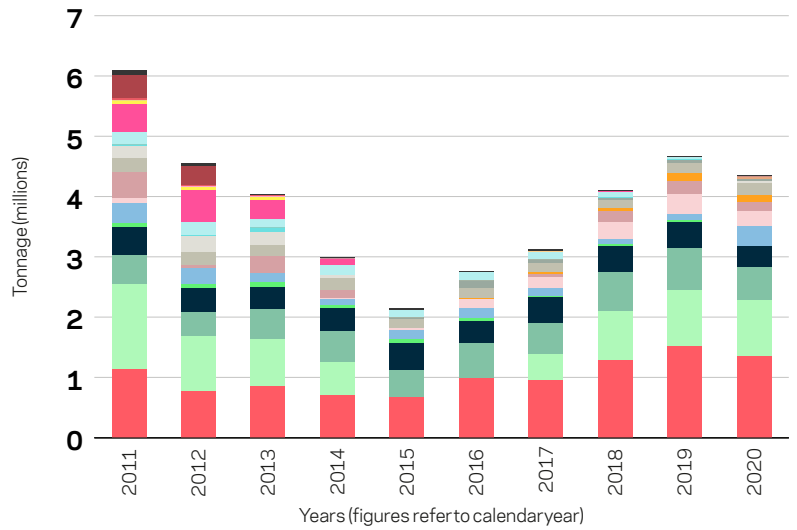
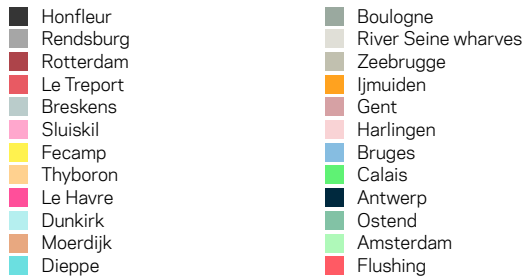


Medium gravel
20 - 40mm

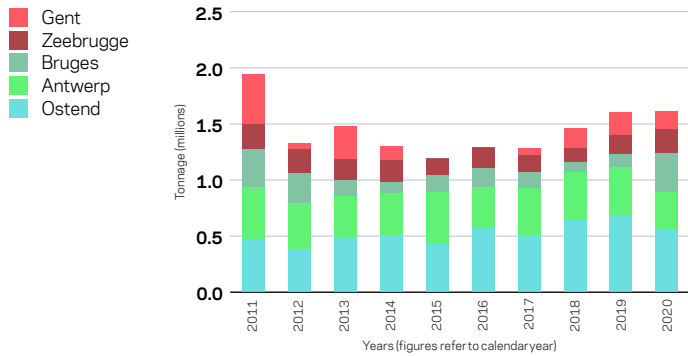


Coarse gravel
40 - 63mm

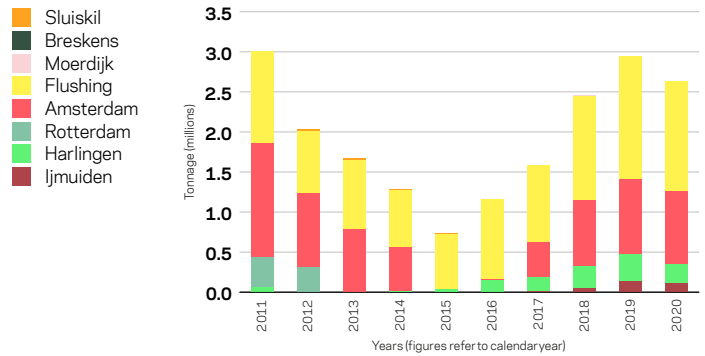
Export to mainland Europe from the UK



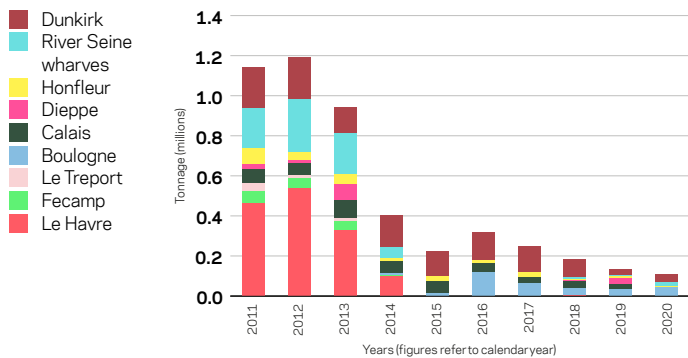
Delivery of marine aggregate to Belgium



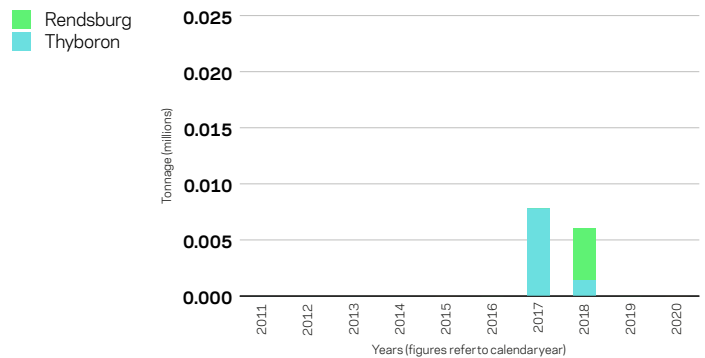
Delivery of marine aggregate to The Netherlands



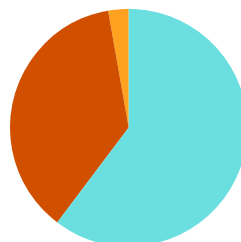
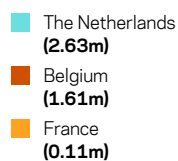
Delivery of marine aggregate to France



Delivery of marine aggregate to Northern Europe



During 2020 material extracted from Crown Estate licensed areas was exported to:



Uses of marine aggregates around the UK

The below projects have all used marine aggregates in their construction.

Coastal & flood defences

- 1 Minehead Beach
- 2 Sea Defences (reefs), Sea Palling
- 3 Thames Barrier, London
- 4 Clacton Beach
- 5 Colwyn Bay Beach
- 6 Pevensey Bay Beach
- 7 Lincshore Beach
- 8 Dawlish Warren Beach
- 9 Bacton to Walcott Sandscaping scheme

Commercial development & regeneration

- 10 1 New Burlington Place W1, London
- 11 20 Fenchurch Street (Walkie-Talkie), London
- 12 Cardiff Bay Barrage
- 13 Canary Wharf & Docklands Developments, London
- 14 Central St Martins, London
- 15 Spinnaker Tower, Portsmouth
- 16 Superstore site raising, Seaton
- 17 Land reclamation, Rochester Riverside
- 18 Dover Western Docks Revival
- 19 St James's Market, London

Energy & utilities

- 20 Energy Recovery Facility, Newhaven
- 21 Wastewater Treatment Plant, Birkenhead
- 22 London Array Wind Farm
- 23 Nuclear Power Station, Dungeness
- 24 Thames Tideway Tunnel, London
- 25 Hinkley Point C Nuclear Power Station, Bridgwater

Community & leisure

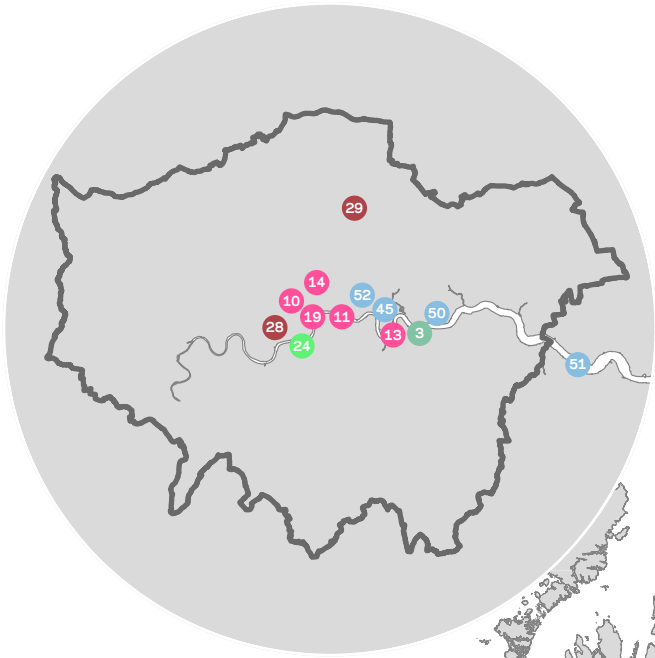
- 26 Principality Stadium, Cardiff
- 27 National Botanic Gardens of Wales, Great Glasshouse, Carmarthenshire
- 28 The Darwin Centre, Natural History Museum, London
- 29 Northumberland Development Project, Tottenham Hotspur FC, London
- 30 British Airways i360 Observation Tower, Brighton

Port development

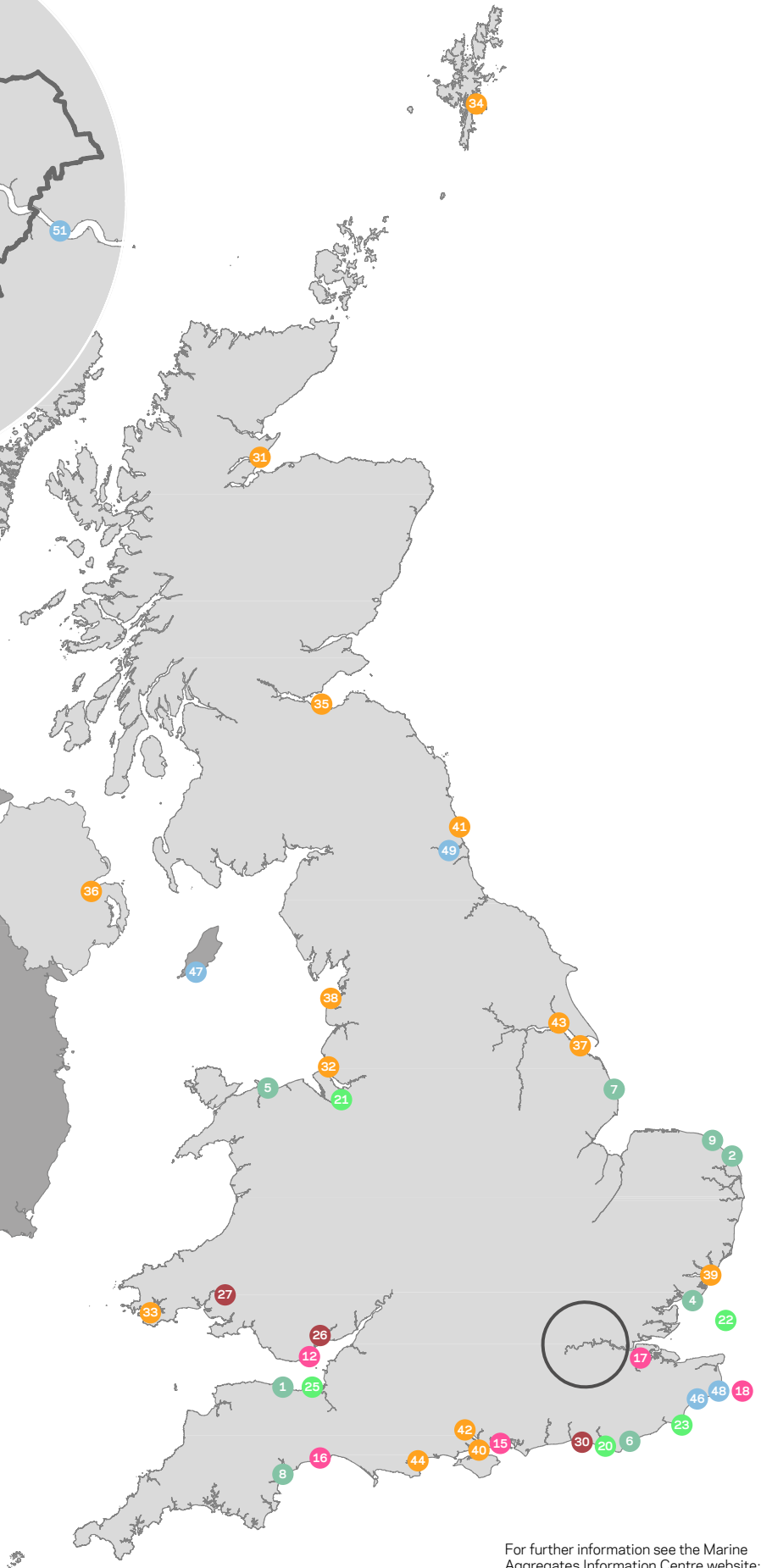
- 31 Nigg Yard, Cromarty Firth
- 32 Liverpool2 Container Terminal
- 33 Oil Terminal, Milford Haven
- 34 Lerwick, Shetland Islands
- 35 Leith Docks, Edinburgh
- 36 Belfast
- 37 Grimsby
- 38 Fleetwood
- 39 Container Terminal, Felixstowe
- 40 Breakwater, Cowes
- 41 Blyth
- 42 Container Terminal, Southampton
- 43 Green Port Hull
- 44 South Quay, Poole

Transport infrastructure

- 45 Canary Wharf Underground Station, London
- 46 Channel Tunnel Rail Link
- 47 Ronaldsway Airport Extension, Isle of Man
- 48 Ferry Terminal, Dover
- 49 Gateshead Millennium Bridge, Newcastle-upon-Tyne
- 50 City Airport, London
- 51 Queen Elizabeth II Bridge, Dartford
- 52 Crossrail, London



- Coastal & flood defences
- Commercial development & regeneration
- Energy & utilities
- Community & leisure
- Port development
- Transport infrastructure



For further information see the Marine Aggregates Information Centre website:
www.marineaggregates.info

Case study: Construction industry

New Lock in Terneuzen

DEME Building Materials Ltd have supplied approximately 300,000 tonnes of marine aggregate from the East English Channel and Humber regions for the construction of the New Lock at Terneuzen in The Netherlands.

With a length of 427 meters, 55 meters wide and 16 meters deep, the New Lock will be one of the largest locks in the world. It will have a lock chamber the same size as those found on the Panama Canal, and is designed to be suitable for large seagoing vessels up to 366 meters long, 49 meters wide and 15 meters deep.

The lock complex at Terneuzen connects the Ghent-Terneuzen Canal (BE/NL) to the Wester Scheldt River (NL).

The Ghent-Terneuzen Canal is the main waterway to and from the Port of Ghent and is part of the Rotterdam-Paris inland waterway route. The New Lock will make it possible to transport more goods by barge rather than by trucks.

The New Lock is being built to accommodate increasing shipping traffic and even larger ships. It is also intended to enhance accessibility for seagoing vessels and barges, and to support economic growth in the region. It will result in more efficient inland shipping traffic between the Netherlands, Belgium and France, and a more robust lock complex.

The total amount of material needed for the construction of the New Lock is 325,000m³

of concrete, 32,000 tonnes of concrete reinforcement bars, 60,000 tonnes of steel for the files, D-walls, doors and bridges and 9,500,000m³ of dredged soil.

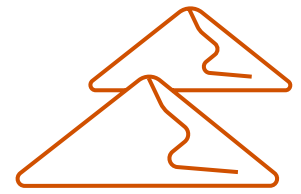
The complete project will require some 630,000 tonnes of marine concrete aggregates that are being produced at DEME Building Material's marine aggregate wharf in Vlissingen, located approximately 20km from the project site.

The aggregates are transported to the project by barges of typically 3,000 tonnes. These carry combined loads of marine sand and marine gravel,

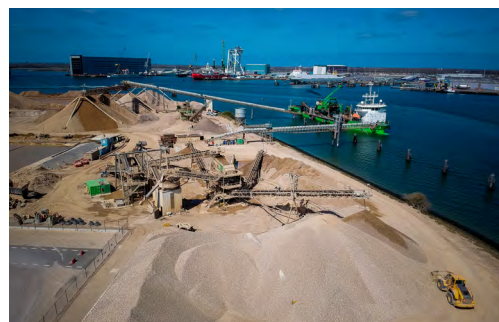
i.e. one barge carries both sand and gravel in separated loads to improve on logistics, economising on transport while balancing stock levels.

During the construction of the New Lock, the four primary functions of the lock complex will have to be taken into account: keeping out high water, discharging water, maintaining shipping traffic and maintaining road traffic.

The New Lock in Terneuzen will be the third major lock in the Benelux region that is being constructed using marine aggregates, the other two being the Kieldrecht in Antwerp and the new lock in IJmuiden.



Approx.
300,000
tonnes
of marine aggregate
was used



Case study: Coastal adaptation

Hythe Ranges sea defences

In 2019, Van Oord was appointed as the design and build contractor to deliver the £25 million scheme to refurbish the beaches at Hythe for the Environment Agency. A very tight grading specification with minimal fines (less than 25% below 2mm grain size) was required to replenish the Hythe beach, part of which is internationally designated as a Special Protection Area for wading birds.

Trailing Suction Hopper Dredger Vox Amalia, a new addition to the Van Oord fleet with a hopper capacity of 18,900m³, was deployed for

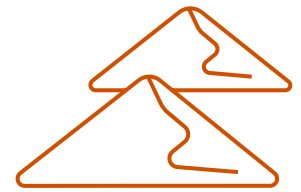
the project over the summer of 2020. Prior to its arrival on site, the Vox Amalia was fitted with a purpose designed screening system. This also required modifications to pipelines, valves, sensors and operating system software to achieve the required material grading. The material was dredged from Volker Dredging Ltd's licenced area 461, located in the East English Channel region.

The Vox Amalia pumped the material to the shore via a 1,500m long, temporary steel pipeline placed on the seabed. A rigorous sampling and testing regime was used to check

the grading of the supplied material and all 370,000m³ of material was proved to be fully compliant with the specification.

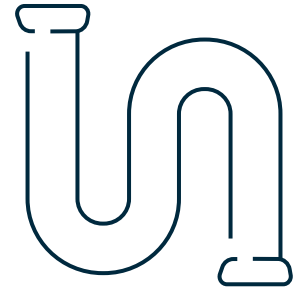
As a result of the works the enhanced beach now provides increased protection from wave overtopping and absorbs wave energy.

New timber groynes also help to control and manage the flow of shingle through the frontage and a newly installed rock revetment provides a back-stop defence at the most vulnerable location, the historic Grand Redoubt.



370,000m³

of marine aggregate was used



1,500m

Pipeline used to pump material to shore



Images courtesy of Van Oord

Electronic Monitoring System update

The Crown Estate Electronic Monitoring System (EMS) was launched in 1993 in order to monitor the activities of vessels on licensed dredging areas.

When fitted on a vessel, the EMS automatically records the date, time and location of all dredging activities.

The EMS was upgraded in 2018 to a new modern specification system supplied by Foreshore Technology Ltd.

This system is well suited to vessels regularly dredging from Crown Estate licences. The level of activity warrants a hard-wired, long term installation.

Key features of the EMS:

- A robust, secure black box based system
- An independent differential GPS to track vessel position
- An independent acoustic sensor to indicate vessel dredging status
- A display unit that gives vessel crew key information
- A data log recording frequency of ten seconds
- A dedicated helpdesk and system repair facility
- A web portal where all recorded information can be accessed by authorised personnel

Where less frequent vessel visits to Crown Estate licences are made, for example for beach recharge, reclamation or capital projects, it can be hard to gain access to vessels and justify the inconvenience and cost of a permanent installation of the EMS system.

To date, such vessels have relied on legacy 2005 EMS hardware. This approach is unsustainable due to the ageing equipment involved and risks around reliability.

For these types of vessel, a temporary Contractor EMS (EMSc) was developed by Foreshore Technology in late 2020.

Key features of the EMSc:

- All bridge-based equipment is housed in a single, portable case
- A small case is deployed near the dredge pipe, with a short cable connecting it to an acoustic sensor. This unit can be duplicated for vessels with two pipes
- Sensor information is recorded and passed to the bridge unit via radio communication
- Each unit stores information locally to reduce the risk of data loss
- The system does not have a screen (system status can be accessed on a web browser)
- The simpler configuration makes it more suitable for installation by vessel crew if necessary, under guidance from Foreshore Technology staff
- With correct preparation, installation is possible in 4-8 hours

EMSc units are now available for use and have so far been successfully deployed on vessels operating on beach nourishment projects at Bournemouth and the Lincolnshire Coast.



Sensor on pipe



Permanent EMS black box



EMSc black box unit

UK dredging fleet update

The UK dredging fleet is now entering a period of renewed investment, and as a result several new vessels have recently begun operations on Crown Estate licenced areas.

The 'CEMEX Go Innovation'

Officially launched 2019, this vessel represents the first new dredger in the CEMEX UK Marine fleet for over 20 years. The vessel is the result of close cooperation between

CEMEX UK Marine and Damen Shipyards and was built in Romania.

The vessel has successfully completed sea trials and is now operational, dredging sand and gravel in the English Channel and North Sea up to depths of 55m.

The Anchorage

Launched in June 2020, the Anchorage is owned by De Hoop Terneuzen, a family

owned company which is a major supplier of building materials in Holland and Belgium.

The vessel is scheduled to operate on a new dredging Production Agreement area in the East English Channel from 2021.

The Yed Prior

Rather than being a brand new vessel, the Yed Prior is a converted container ship. The

conversion to a trailing suction hopper dredger was carried out at the Niestern Sander dry dock for the new vessel owners, Spaansen.

The conversion works were carried out in a challenging time dominated by the Covid-19 pandemic, adding an extra layer of complexity to the project.

The completed vessel was launched in August 2020, and commenced work in the UK in early 2021.



Image courtesy of CEMEX UK Marine



Image courtesy of Barkmeijer Shipyards

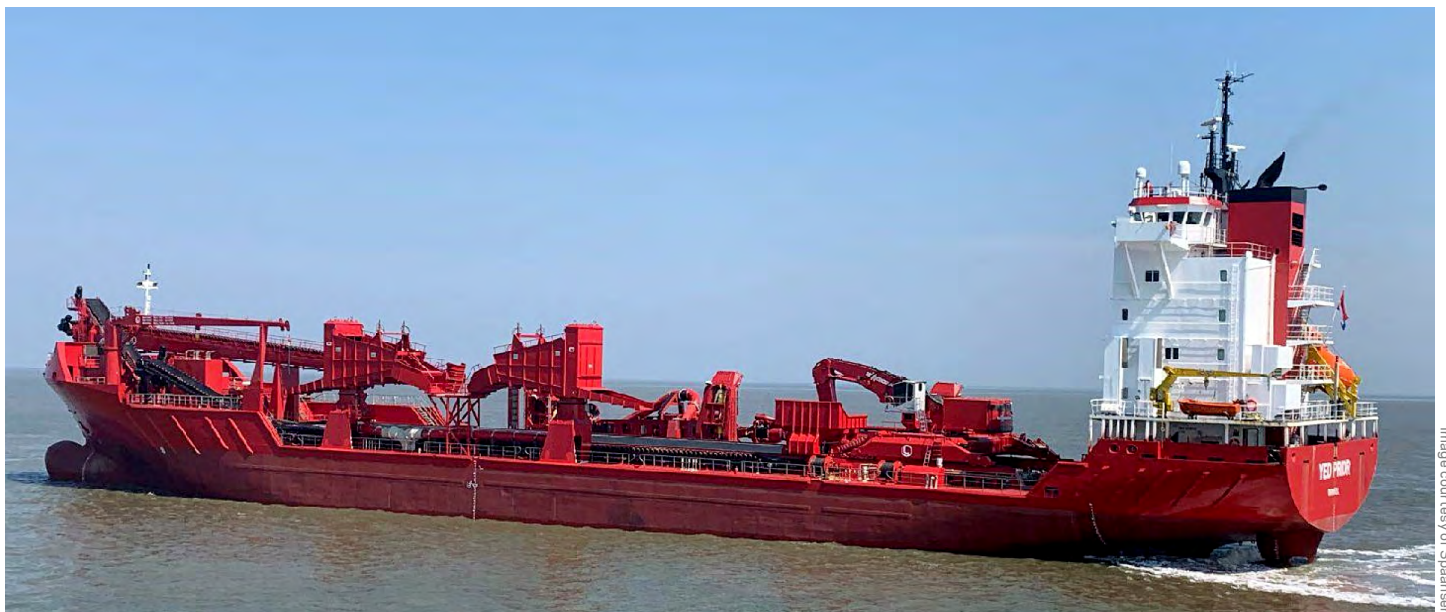


Image courtesy of Spaansen

Prehistoric finds from Bacton Sandscaping project

During the summer of 2019 the beaches in front of Bacton Gas Terminal and the villages of Bacton and Walcott were transformed as a result of a Sandscaping scheme, with the aim of protecting the coast from erosion and flooding (www.north-norfolk.gov.uk/sandscaping).

During this time approximately 1.8 million cubic metres of sand and gravel were deposited, sourced from East Coast licensed dredging areas.

By the winter of 2019 members of the public walking on these beaches were discovering a multitude of worked flint and faunal

remains dating to the Middle Palaeolithic (around 300,000 to 40,000 years ago). Due to the reporting arrangements put in place as a result of significant Palaeolithic finds at nearby Happisburgh, the majority of the artefacts found at Bacton and Walcott were passed to Norfolk Historic Environment Record (HER), and the British Museum. By March 2020 approximately 750 stone artefacts, as well as 100 fossils had been discovered and reported, representing a hugely significant archaeological assemblage.

To support future reporting, and build upon the excellent recovery rate made by the

dedicated locals, a public outreach project was commissioned through North Norfolk District Council.

With Archaeologists funded by the Anglian Offshore Dredging Association now assessing the artefacts likely seabed origin.

It is also hoped a specialist study to understand the flint tools will be able to shed light Neanderthal activity during the Middle Palaeolithic in the now submerged landscape of the southern North Sea. This will further contribute to the important and large body of archaeological work carried out in the East Anglia dredging region.

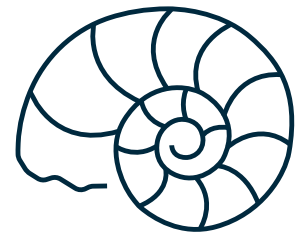


1.8 million m³

marine sand placed on the beaches



750 approx. number of stone artifacts found



100 fossils discovered



Images courtesy of Hanson

Marine barging - Hull to Leeds

For the first time in almost 20 years, a barge has transported a commercial load of aggregate into Leeds by canal from a wharf located over 60 miles away in Hull.

The story begins a few years ago, with a concern in the minerals planning community that there would be a future shortfall in the onshore sand and gravel land bank in Yorkshire and Humberside, potentially leaving a significant hole needing to be plugged.

Together with the minerals planning authorities of Leeds City Council and North Yorkshire Council, we jointly commissioned a market study into the supply situation. It confirmed the potential shortfall and identified marine aggregates as a possible supplement to the declining land-based resource, albeit with some cost and logistical barriers to overcome.

AC Marine Aggregate is a well known local company trading building materials in the local

region. They made contact with marine works company, Van Oord, which resulted in a supply agreement. With the supply contract in place, AC Marine Aggregates opened a wharf in Hull around five years ago and has built a business supplying marine aggregates to the local market. They had started the venture with a long-term vision of using commercial barges and the nearby waterways network to supply other markets further inland, such as Leeds.

The journey to transporting marine aggregates along the river and canals, with all the associated benefits it would bring, involving dredging of the waterways, locating suitable barges and bargees, and establishing receiving wharves at the destination.

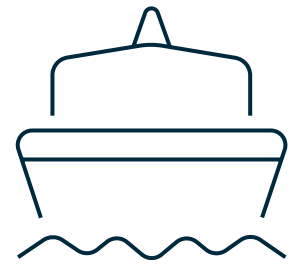
With help from the Canal River Trust (CRT), Commercial Boat Owners Association and support from Leeds City Council, AC's vision started to become a reality. Last year CRT agreed to allow them to use a

wharf in the centre of Leeds, which was the final piece in the jigsaw.

The benefits of using a barge to transport marine aggregates over trucks are multiple. The distance from Hull to Leeds by road is 60-70 miles, considerably longer than a typical road journey for a bulk, low value commodity like aggregate. Using a 500-tonne barge takes the equivalent of 25 standard tipper trucks off the road, with the associated improvement in air quality and reduction in traffic congestion.

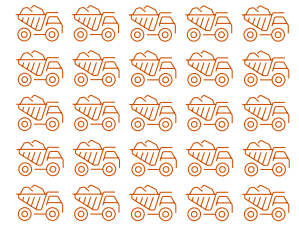
On 22nd September 2020, the Farndale H working barge carried 400 tonnes of grit sand into Leeds, the first time in 19 years a commercial freight in the form of aggregate had come into the city by barge.

There's still more work to do to make the waterways an even more efficient and sustainable transport system, but given the perseverance of all involved, anything is possible.



1 barge
(of 500 tonnes)

is equivalent to



25
standard
tipper
trucks
(of 20 tonnes)



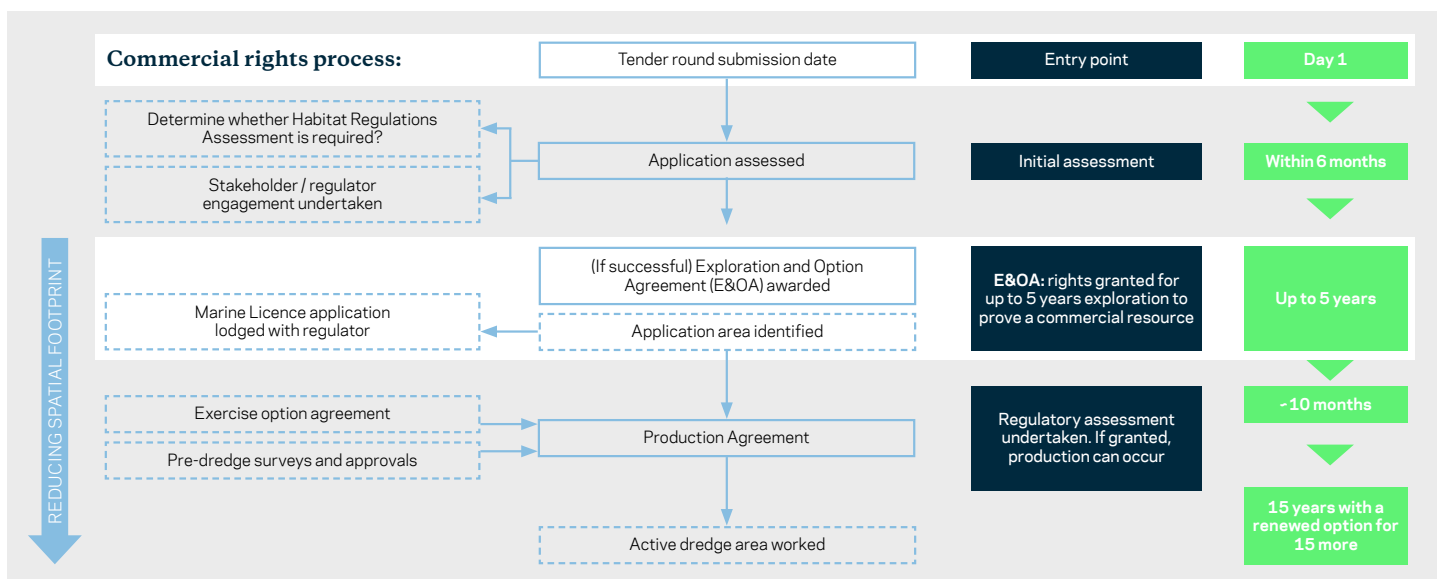
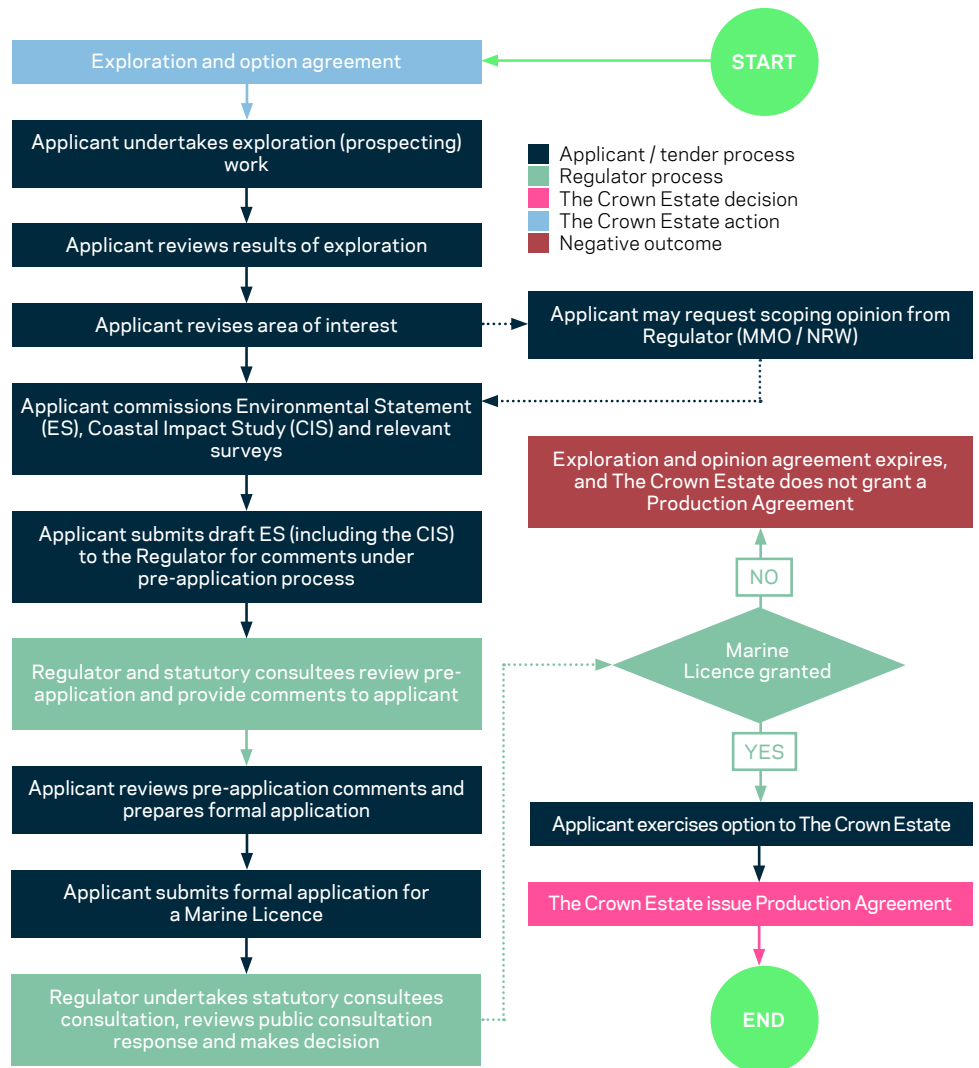
James Hardisty for The Yorkshire Post

Obtaining rights for sand and gravel extraction

To obtain a licence from The Crown Estate for the rights to extract marine aggregates from the seabed, a number of stages are involved.

- The first stage is to identify an area of interest and submit a tender bid during a Marine Aggregates Tender Round (usually held every two years by The Crown Estate)
- Once a bid is submitted the tenders will be assessed by The Crown Estate and rights may be awarded
- Once the commercial rights have been secured from The Crown Estate the second phase of the application process commences
- The successful tenderer is required to apply for a Marine Licence (environment and legal rights/permissions) from the regulator (Marine Management Organisation in England, and Natural Resources Wales in Wales).

Only if a Marine Licence is received will the applicant be able to request The Crown Estate issue a Production Agreement for extraction to commence. The Marine Licence and commercial rights processes are summarised in the following flowcharts.



The Crown Estate is a unique business with a diverse portfolio that stretches across the country. We actively manage our assets in line with our purpose: to create lasting and shared prosperity for the nation.

We manage the seabed, and half the foreshore, around England, Wales and Northern Ireland, and therefore play a key role in enabling the UK's offshore wind industry, as well as helping to facilitate the development of sectors such as cables, pipelines, CCUS and marine aggregates.

Our portfolio also includes: some of central London's best places to work, shop and experience; regional retail and leisure destinations across the country; a substantial rural portfolio; and the Windsor Estate, including the world-renowned Windsor Great Park.

Established by an Act of Parliament, we are tasked with generating profit for the Treasury for the benefit of the nation's finances, this has totalled £3bn over the last ten years.

Links and useful references

The Crown Estate

www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/minerals-dredging

Marine Aggregate Information Centre

www.marineaggregates.info

British Marine Aggregate Producers Association

www.bmapa.org

Marine Management Organisation

www.gov.uk/mmo

Natural Resources Wales

www.naturalresourceswales.gov.uk

British Geological Survey - Minerals UK

www2.bgs.ac.uk/mineralsUK