

# Strength from the depths

a sustainable development strategy  
for the British marine aggregate industry



British Marine Aggregate Producers Association • November 2006

# Introduction

The British Marine Aggregate Producers Association (BMAPA) is a constituent of the Quarry Products Association (QPA), the trade association for the UK construction aggregate industry. BMAPA represents ten member companies with marine interests, who together produce over 90 per cent of the 22 million tonnes of marine sand and gravel dredged annually from the seabed off England and Wales.

In 2005, QPA produced an overarching sustainable development strategy, which covered all processes and products. However, the issues associated with marine aggregate extraction - particularly in terms of the seagoing operations themselves - are very distinct. For this reason, BMAPA has now developed a strategy to address the marine aggregate sector's specific issues.

Extraction of marine aggregates involves a very small proportion of the UK's continental shelf - typically an area totalling some 140km<sup>2</sup> is dredged every year. Despite this small footprint, the industry recognises that the marine environment in which it operates is sensitive, and accepts that it has a responsibility to manage its operations in ways that minimise any effects on the marine environment and on its other users.

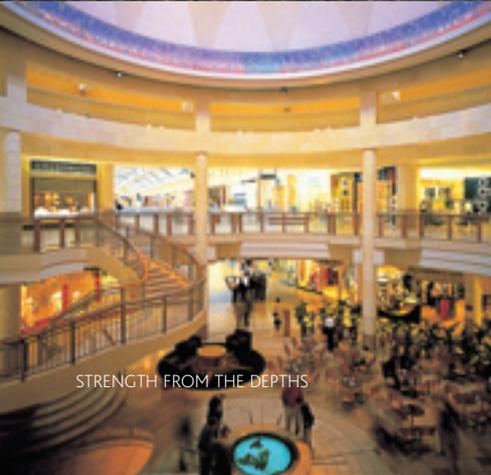
BMAPA members believe this challenge should be approached as a partnership with the other stakeholders involved. This new sustainable development strategy provides a framework and a means of measuring progress. We will welcome comments and advice from all interested parties.



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# Foreword



I am very pleased to be able to welcome and endorse this new sustainable development strategy for marine aggregates which has been developed by the British Marine Aggregate Producers Association. Marine aggregates continue to fulfil an important role in helping the industry to meet society's needs for construction materials and for beach replenishment as part of the UK coastal defence strategy. The Crown Estate, as the major UK marine mineral owner, is very conscious of its responsibilities in the management of these natural resources and is pleased to work with an industry that is so fully committed to sustainable development.

The industry has already contributed a substantial amount of new information about our marine environment, yet there are very real challenges ahead for the sector, at both national and regional levels. Implementation of this strategy will demonstrate that the marine aggregates sector can combine a commercial approach, responding to market needs, with the stewardship of natural resources and effective environmental protection to ensure that our world is fit for future generations.

BMAPA's strategy is detailed and comprehensive, addressing as it does the full range of sustainable development principles. The Crown Estate looks forward to working with BMAPA as it implements this new strategy, and in monitoring progress towards meeting well-defined objectives and targets. The industry can be confident that The Crown Estate will play its part in this vital work.

Roger Bright  
Chief Executive Officer  
The Crown Estate

# Partnership for the future



We have all come to accept over recent years that living sustainably is essential to the future of our planet and to the inheritance we leave for generations to come. It is a global challenge that can only be addressed through localised action from nations, industries and also from individuals. The problem belongs to every one of us.

The aggregates industry has a particular responsibility because we provide natural resources that are consumed by the nation as a whole. In doing so, we use energy, provide employment, contribute to the national and regional economies and have impacts upon the environment. The end-products from our work are fundamental to the daily lives of everyone in the UK.

No project demonstrates this better than the 2012 London Olympics, with its £3 billion-worth of construction and prospects of substantial long-term regeneration for rundown areas of east London. While marine wharves along the Thames are ideally placed to deliver sand and gravel close to where it will be needed, the diverse needs of this massive and multi-faceted project will also demand contributions from nearby land-based quarries and more distant hard rock quarries. But recycled aggregate, drawn from demolition sites across a wide area, will also certainly play a key role. Thus, sustainability has to be delivered by the construction aggregates sector as a whole.

It is how we maintain a proper balance in the complex social, environmental, economic and resource management equation that determines the extent of our sustainability. Partnership between the different aggregates sectors is undoubtedly the best way in which to achieve it.

Marine aggregates provide some 17 per cent of the sand and gravel needs of England and Wales and 6 per cent of Britain's total primary aggregate needs. Our contribution equates to some 50 medium-sized land-based quarries.

We are delighted to be able to build on the exceptional platform provided by the QPA's wider sustainable development strategy. While some of our issues are inevitably different, our core values and objectives are very much in line with the land-based industry.

We recognise that this initial strategy document is only a start and expect to have to adjust our course as we learn from the substantial information-gathering exercise that will follow in year one with the objective of producing our first full report in 2007. We are very keen to engage our various stakeholders in that process and will welcome both comments and advice.

Kevin Seaman  
Chairman  
BMAPA

# Facts and figures

## Transport facts

- A typical dredger (5,000-tonne cargo) delivers the equivalent of 250 lorry loads
- Dredgers deliver into major urban areas or direct to beach repair projects
- Around 20,000 tonnes (1,000 lorry loads) of marine aggregate is delivered daily to Thameside wharves - equivalent to four ships per day
- In London, rail deliveries from marine wharves save 50,000 lorry journeys each year



## Key areas 2005

Area of UK seabed	867,000km <sup>2</sup>	100% of seabed
Area of seabed licensed for dredging	1,179.36km <sup>2</sup>	0.136% of seabed
Area available to be worked	595.9km <sup>2</sup>	0.068% of seabed 50.5% of area licensed
Area dredged	137.55km <sup>2</sup>	0.016% of seabed 11.66% of area licensed

## Market summary 2005

Total GB aggregates market	272mt
Land-based aggregates	191mt
Recycled and secondary aggregates	68mt
Total marine aggregates production	21.2mt
Marine landings to UK aggregates market	13.2mt
Marine landings to European aggregates market	6.5mt
Beach replenishment/fill	1.5mt

## Marine contribution to sand & gravel market 2005

Total GB market	82.4mt
Total England and Wales market	73.6mt
Marine landings to England and Wales	13.2mt
Marine landings to South East	9.3mt
Marine landings to London & Thames Corridor	6.5mt
Marine landings to South Wales (sand)	1.0mt

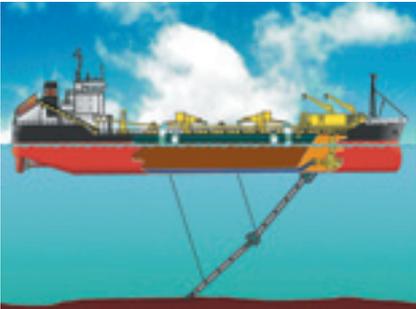
Marine statistics from Marine Aggregate Crown Estate Licences Summary of Statistics, published by The Crown Estate 2005. General statistics from 2005 AMRI Survey, published by the Office for National Statistics

# Dredging and processing

BMAPA members operate a fleet of 25 dredgers which work around-the-clock in areas licensed by The Crown Estate and permitted by the Government. A large dredger can load some 5,000 tonnes in around three hours and discharge in a similar period.

Two types of dredging technique are employed. Static dredging involves a vessel anchoring and is effective in working thick, localised deposits of sand and gravel. Trailer dredging requires the dredger to trail its pipe along the seabed at speeds of up to 1.5 knots.

## Loading

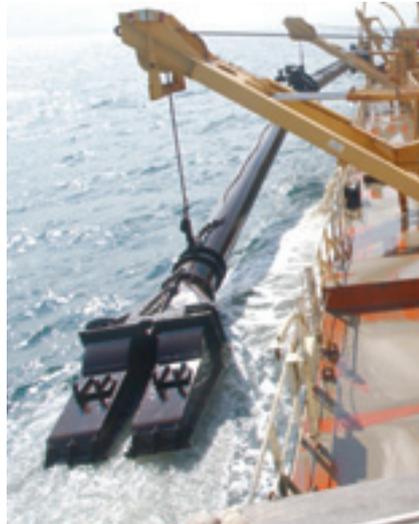


## Discharging



It is employed in working thinner, sheet deposits where the sand and gravel is more evenly distributed across a wider area. To locate the dredging area, vessels use GPS

satellite navigation systems which are accurate to less than five metres. The dredge pipe is then lowered and powerful pumps draw the sand and gravel into the ship's hold, displacing the sea water previously loaded as ballast.



Dredging operations are subject to strict control and enforcement, informed by a black box Electronic Monitoring System (EMS) which all vessels are required to have. The EMS records time, date and location of all dredging activity using an encrypted computer system and GPS satellite navigation. EMS data is analysed every month by the Crown Estate to ensure that dredging only takes place within the areas permitted within each licence area.

Aggregate wharves have advanced screening and washing facilities to produce construction aggregate, although some sell the product without the need for processing. The greatest demand is for sand and for 10mm, 20mm and 40mm gravel. Any over-size gravel is usually crushed to produce smaller grades. Ready-mixed concrete and concrete products are the

main uses of marine aggregates, and many wharves now incorporate manufacturing facilities.



Marine aggregate is also used for beach replenishment, supporting coastal defence projects. Large volumes of sand and gravel can be supplied to coastal frontages through pipeline or by barge. With the predicted increase in sea levels, the use of marine sand and gravel to provide 'soft' defences is expected to increase.



# Our values

BMAPA members operate to a set of core values, the majority of which are common to the land-based industry.

## Social progress

### Health & safety

Our highest priority is the health and safety of employees, contractors and visitors.

### Competence

We aim to maintain and develop a competent workforce.

### Good neighbours

We engage with coastal communities and strive to be seen as good operators by other marine users.

### Partnerships with stakeholders

We value our partnerships with all our stakeholders.

## Environmental protection

### Natural environment

We recognise the potential of our operations to have impact upon the marine environment and are committed to minimising and mitigating such effects.

### Shared environment

We share the marine environment with a range of other users such as fishing, shipping, energy and recreation and have a responsibility to operate with due regard to

their needs.

### Heritage

We recognise the historic significance of the seabed around the UK and believe that we can make a positive contribution to the understanding and protection of the marine historic environment.

### Marine stewardship

We have a responsibility to manage our operations in order to minimise the significance of our operations to both stakeholders and the environment.

## Natural resources

### Resource management

We recognise our responsibility to make the most efficient and sustainable use of finite marine aggregate resources.

## Economic prosperity

### Providing essential materials

We recognise that the materials we supply are, and will continue to be, essential for the improvement of standards of living and the quality of life in the UK.

### Employment

We recognise that our operations are an important source of employment and economic activity.

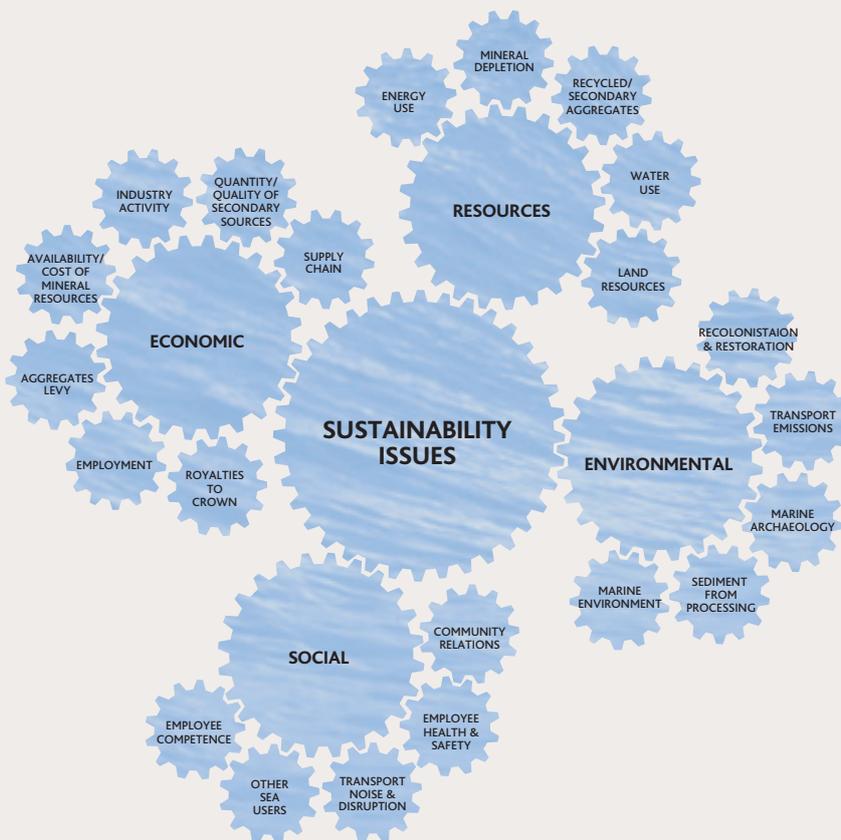
# Our approach

Our strategy dovetails with the wider sustainable development strategy of the Quarry Products Association (QPA) and builds on the experience from its publication in 2005 and its first annual report in 2006.

In common with QPA, we will draw upon the work that our individual members have done in evolving their own company strategies. In several cases, our members have the larger UK aggregate producers as their parent companies and, therefore, benefit from what they have achieved.

While UK government produced a revised definition for sustainable development in March 2005, our strategy will relate closely to the four main themes of the UK Strategy for Sustainable Development published in 1999:

- Social progress which recognises the needs of everyone
- Maintenance of high and stable levels of economic growth



Our approach addresses key sustainability issues as shown in the diagram opposite. We will also draw upon the central core values shown here, which have been evolved from those defined by the QPA.

All this has in turn been used in the development of specific objectives and key performance indicators relevant to each of the above pillars of sustainable development. It will be against these that we will measure progress in the years ahead.



## Timetable

### 2007

- Finalise objectives and key performance indicators
- Undertake first survey of members to establish baseline data from 2006
- Assess survey outcomes
- Benchmark against UK and EU performance indicators
- Agree targets for improvement and action needed
- Produce first annual report setting the baseline figures.

### 2008

- Repeat member survey one year on using 2007 data
- Publish second report to evaluate progress.

# Social progress

## Objective 1

Improving the occupational health and safety of the marine sector's employees.

### Indicator

- Working days lost through work-related injury.

## Objective 2

Improving employee development through vocational training.

### Indicators

- Training days per employee
- Recognised qualifications achieved.

## Objective 3

Increasing the transparency of activities. Maintaining and developing further liaison with other marine stakeholders.

## Social progress that recognises the needs of everyone

As a supplier of essential materials, the marine aggregate industry is an important contributor to the British construction industry and to the part that it plays in daily life. Its role is indivisible from that of the wider aggregates sector in supporting projects that are central to government policy such as:

- a £4 billion programme providing 15 new hospitals by 2010
- plans for 650 new schools across the UK by 2014
- The Thames Gateway project, which will regenerate a 40-mile long swathe of land to the east of London, providing 128,000 new homes and 232,000 additional jobs by 2016.

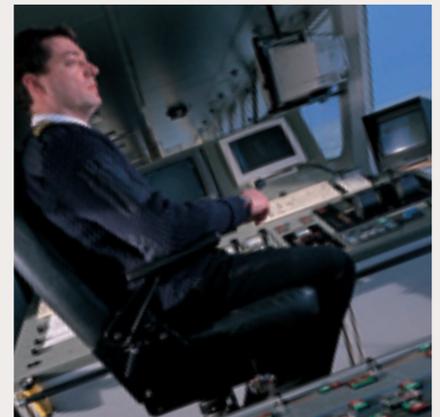


- the Sustainable Communities Plan with its £5.5 billion affordable homes strategy
- £3 billion worth of construction for the 2012 London Olympics
- The £4 billion Terminal 5 project, which will allow Heathrow airport to handle an additional 30 million passengers.

A third of British marine aggregate production is supplied to our European neighbours for use as construction aggregate, contributing to the UK's balance of payments. Marine aggregates also provide the only viable source of material for large-scale beach nourishment, which is important in protecting communities and maintaining the tourist industry around vulnerable coastlines, especially along the east and south coasts. Since 1995, over 25 million tonnes has been used in this way.

The marine aggregates industry employs a total of 600 people, of whom 450 man the fleet of dredgers operated by BMAPA members. The remainder are employed in shore-based marine operations and management roles. The industry is committed to providing them with the training opportunities that will enable them to enjoy and further develop their careers. It is estimated that a further 4,000 jobs rely indirectly on the industry.

The health and safety of employees is the wider aggregate industry's top priority. The marine sector has been an active participant in the Quarry Products Association's *Hard Target*



initiative, which successfully set out to reduce lost-time accidents by half over the five years to March 2005. It is now committed to the new target of a further 50 per cent cut over the next five years. Additionally, BMAPA members have each put in place rigorous procedures to ensure compliance with the International Safety Management Code. They also readily share best practice and "near-miss" information for the good of all.

While many of the marine aggregate sector's activities take place a considerable distance offshore, this does not mean that it operates 'out of sight, out of mind'. The sector is well controlled - both through regulation and self-imposed good practice - and is committed to the transparent reporting of its activities through provision of clear information and engagement with other interested stakeholders.

# Economic growth

## Objective 1

Maintaining and improving profitability in order to provide for continuing investment and employment.

### Indicators

- Annual marine production
- National/regional marine contribution to supply
- Employment - direct/indirect.

## Objective 2

Maintaining and increasing investment in dredgers and dredging technology in order to improve efficiency and environmental performance.

### Indicators

- Profile of age/capability of dredging fleet
- Investment in vessels/technology over previous five years.

## Maintenance of high and stable levels of economic growth and employment

Marine aggregates are part of a much bigger economic picture created by the wider UK quarry products industry and by the construction sector which it feeds. Sales of quarry products in the UK total over £4 billion a year and the sector employs some 38,000 people. Half are directly related to the production of aggregates. Downstream of that are many hundreds of thousands of construction jobs in a dependent industry which makes a £100 billion annual contribution to the economy.

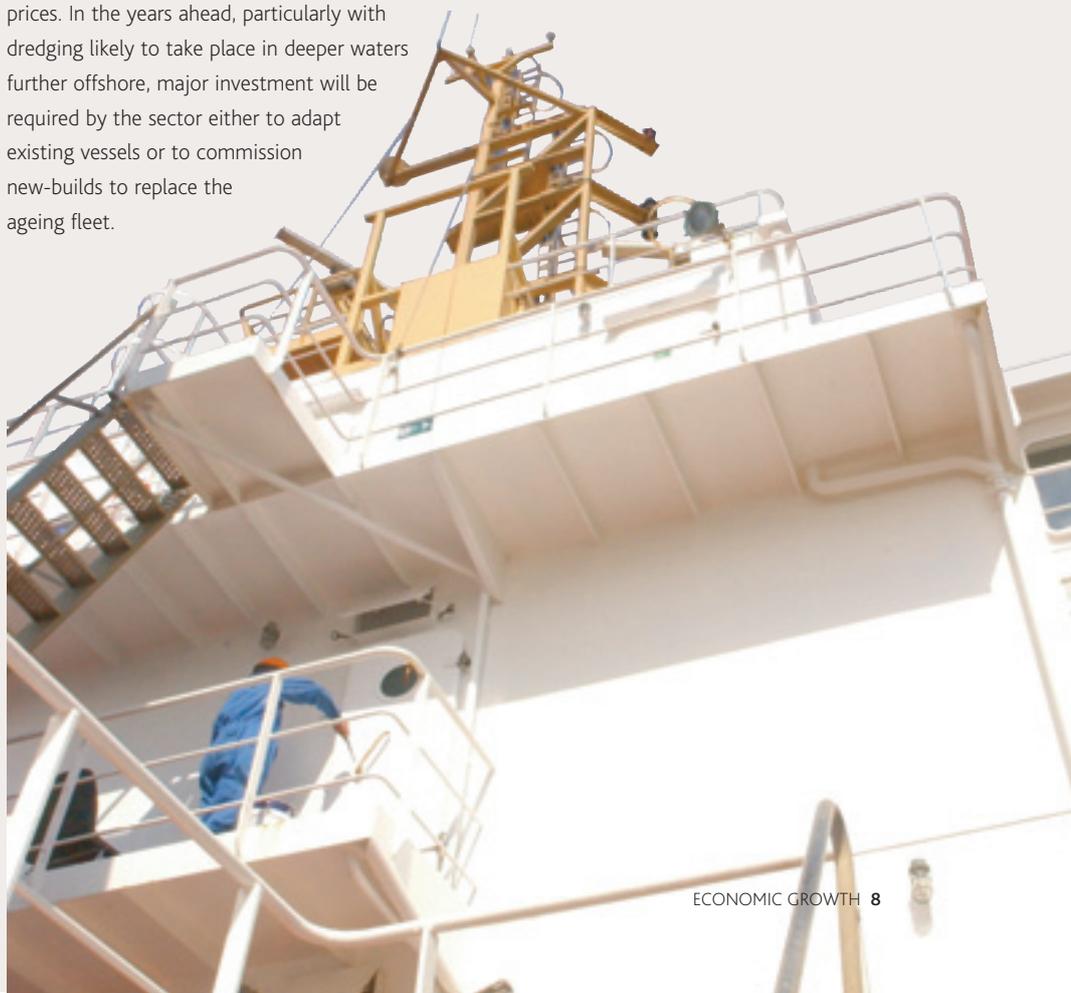
In a typical year, operators produce over 200 million tonnes of primary aggregates (sand, gravel and crushed rock), of which marine sources account for over 20 million tonnes. This figure has been significantly reduced by the success over recent years in developing recycled and secondary aggregates. Current use of such materials stands at some 65 million tonnes pa - representing about a fifth of British consumption.

The marine aggregate industry's economic contribution is particularly strong in the regions that receive its materials. In London, half of all sand and gravel comes from marine sources, while in the wider south east it contributes a third. In south Wales, 90 per cent of the fine aggregate used for construction purposes is dredged. The east and south coasts and the north west also benefit considerably from the industry. In all these areas, there is an important "knock-on"

benefit from the money the industry spends with ports, hauliers, engineering companies and other suppliers.

The industry's existing dredging fleet represents a substantial and significant long-term investment - with a typical vessel costing well over £20 million and expected to have a working life of 25 years. To replace the existing fleet of 25 vessels would require the industry to invest over £500m at today's prices. In the years ahead, particularly with dredging likely to take place in deeper waters further offshore, major investment will be required by the sector either to adapt existing vessels or to commission new-builds to replace the ageing fleet.

Revenue generated from royalties on production will continue to flow via The Crown Estate to the Exchequer for the benefit of the nation as a whole. In the financial year 2005/06, the contribution of the marine aggregate sector to The Crown's Marine Estate was over £15 million.



# Environmental protection

## Objective 1

Minimise the spatial footprint of dredging operations through responsible and effective management.

### Indicators

- Area of seabed licensed for dredging
- Extent of active dredge area
- Area of seabed actually dredged

- Area of seabed where 90 per cent of dredging occurs
- Area of seabed dredged for more than 1.25 hours.

## Objective 2

Maintain and develop industry contribution towards the understanding of the marine sand and gravel habitats.

## Objective 3

Maintain and develop industry contribution towards the understanding of Britain's marine historic environment.

## Objective 4

Reduce the impact of atmospheric emissions released through the production and transport processes.

## Effective protection of the environment

The marine environment - like its terrestrial equivalent - is potentially sensitive and those who work in it have a responsibility to manage their activities in order to minimise any potential impacts. The marine aggregate industry takes that responsibility seriously. Its operations are licensed by The Crown Estate as the landowner, and regulated by the Government, which is in the process of introducing a new statutory licensing procedure.

New licence applications are accompanied by comprehensive environmental assessments that consider each of the potential impacts and provide stringent management and mitigation measures that are enforced by Government. Ongoing activities are managed and monitored to ensure that the effects are within acceptable limits. If the effects fall outside these limits, operations can be modified or even stopped.

The areas of seabed licensed and dredged are important indicators of the sector's potential to affect and interact with both the marine environment and with other users. Through a joint initiative with The Crown Estate, the marine aggregate sector has been reporting the total area of seabed licensed and dredged on a voluntary basis since 1998. Marine aggregate dredging creates a physical effect and the spatial extent of operations provides a good indication of the overall scale of the environmental footprint. Through analysis of

### Licensed areas



### Typical working area



electronic monitoring systems, which record the time and satellite position of all activity on Crown Estate licence areas, both the extent and intensity of annual dredging activity can be determined.

The spatial extent of the marine aggregate industry's operations is also relevant to other

marine users - particularly the fishing industry. Regular liaison meetings are held to facilitate the exchange of information and views, and BMAPA and The Crown Estate produce and widely distribute bi-annual zoning charts which define the extent of the licensed area that is being dredged - termed the 'active dredge area'.

Government policy is to minimise both the area of seabed licensed and the area of seabed actually dredged. Annual reporting of these figures by BMAPA and The Crown Estate has taken place since 1999, and the progressive information now represents a key indicator of the sector's overall environmental performance.

The control and management of the sector is based on a sound understanding of the distribution and quality of the geological resources being worked. This in turn is informed by good quality data, and the industry is constantly improving its knowledge base through additional survey activity.

Similar principles apply to the potential effects upon features of marine nature conservation or biodiversity importance. Through its data acquisition, the industry makes a significant contribution to improving our understanding of the location and distribution of such sites, which in turn helps deliver national nature conservation and biodiversity objectives. As part of this process, BMAPA has signed

### Indicators

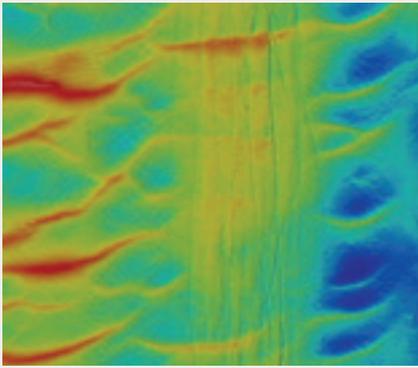
- Fuel oil consumed per tonne landed
- Sulphur dioxide emissions
- Nitrogen dioxide emissions.

## Objective 5

Maintain effective controls to minimise the potential of pollution to the marine environment.

### Indicator

- Number of recorded incidents.



memorandums of understanding with English Nature and The Wildlife Trust to improve liaison and engagement.

Much of what is now seabed around the UK coastline was once land that has been submerged by rising sea levels. Such submerged landscapes often have archaeological value, as do the wrecks that tell the story of a seafaring nation. The marine aggregate industry recognises the importance



of protecting such heritage and of learning from it when it is practical to do so.

BMAPA has worked in partnership with English Heritage in the production of an archaeological guidance document that provides developers, regulators, consultants and heritage professionals with a well-defined statement of policy on marine aggregate extraction. It now provides the background to ensure effective monitoring and mitigation.

Our knowledge of the marine environment continues to evolve, and the sector is committed to supporting research and data acquisition to ensure that its activities can be managed and controlled in the most effective, appropriate and sustainable manner.

The control of marine pollution is a well established principle, policed through the International Convention for the Prevention of Pollution from Ships (MARPOL Regulations 73/78). Under the International Safety Management code, individual aggregate dredgers have defined management schemes in place to prevent marine pollution from occurring. Should an incident occur, specific plans exist to minimise the potential effects.

A major advantage of marine dredged aggregates is the ability to transport large volumes of a low-cost bulk product over large distances, and to deliver close to where the market demand exists. For this to be effective,

larger vessels are used to deliver cargoes over greatest distances (over 200 miles), while smaller vessels operate over shorter distances. However, through both the production of marine aggregates and through their transport, the industry consumes fuel and generates emissions to the atmosphere. It is, therefore, in operators' interests to minimise the consumption of energy as far as possible, by making the most efficient and effective use of the dredging fleet available - both in production and transport terms.

By implementing this sustainable development strategy, the industry will develop a better understanding of the overall carbon footprint associated with marine aggregate production.



# Natural resources

## Objective 1

Make the most efficient use of available licensed resources.

## Objective 2

Minimise the screening activity in the production process.

### Indicator

- Hours dredged per tonne landed.

## Objective 3

Maximise the efficient use of the dredging fleet.

### Indicator

- Kilometres travelled per tonne landed.

## Objective 4

Develop and promote best practice for resource management.

## Prudent use of resources

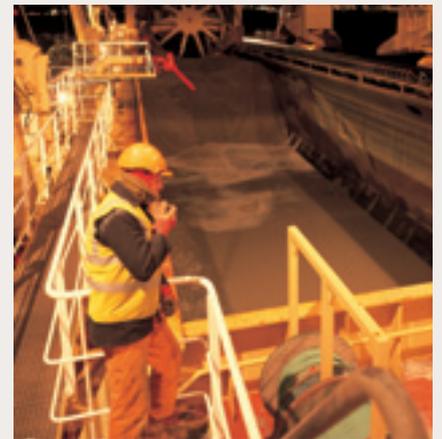
Marine aggregate dredging provides us with resources that make modern life possible. Like all minerals, however, sand and gravel is ultimately finite and it is important that our use is managed responsibly. Dredging, together with subsequent processing and delivery, are processes that necessitate the use of energy at sea and on land.



While representing a finite resource, marine aggregates are fully recyclable. When a structure or building constructed using marine aggregates reaches the end of its useful life, the demolition material can be re-used in new construction projects.

As a finite resource, the extraction of marine aggregates has to be carefully managed in order to maximise the potential reserve while minimising potential environmental impacts and waste. The change in the area dredged since 1998 is a reflection of this change in approach, whereby a better level of geological understanding of the deposits being worked is being used to manage the dredging operations more effectively. This delivers improvements to both resource management but also to the environmental footprint of the sector's operations.

Marine aggregate dredgers have the ability to alter the composition of the sand and gravel retained in the cargo hopper through a process known as 'screening'. By passing the dredged sediment over wire screens, the ratio between the sand/gravel retained onboard can be changed. The over or under-sized fraction is returned to sea. This ability to modify the composition of the retained cargo is valuable, as often the natural composition of the resource will not correspond to that required by the end-use - whether for construction purposes or for beach recharge. The ability to screen also allows the economic working life



of production licence areas to be extended - particularly important given the age of many areas currently being worked.

Screening is not, however, without its issues as the material returned to the sea creates a plume of sediment which can extend beyond the area actually dredged. Consequently, screening may be restricted or even prohibited in environmentally-sensitive areas. There is also a commercial implication. If a vessel screens while dredging, the time spent loading a cargo can double or even treble. This in turn increases energy consumption, and decreases the productivity of plant.

Time spent screening, therefore, provides a useful indication of the state of the industry's reserve base, the energy efficiency of the dredging operations and the potential effects on the environment.

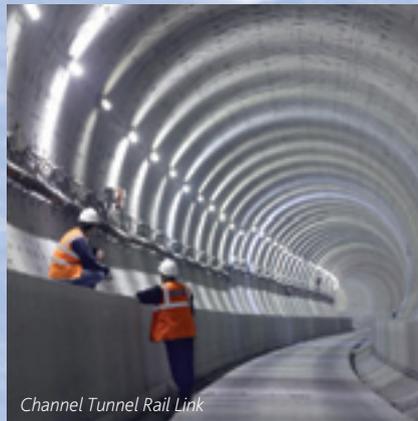
# Marine aggregates at work



## Canary Wharf

Few major construction projects have been better placed to benefit from marine aggregates over recent years than Canary Wharf in London's Docklands. While most marine sand and gravel deliveries end by lorry, the Thameside position of the 97-acre site meant that the final stages of many deliveries could be made by barge from wharves at Greenwich.

Opened in 1991, Canary Wharf now provides jobs for 80,000 people and comprises 24 office buildings, five retail malls, two Docklands light railway stations and a London Underground station as well as landscaped parks. The underground station, with its cathedral-like interior beneath glass canopy entrances, has added greatly to passenger flows in east London.



## Channel Tunnel Rail Link

Construction of the 68-mile long Channel Tunnel Rail Link and associated stations has depended heavily upon marine aggregates to bring the UK into Europe's high-speed rail network. Crucial has been the capability of dredgers to deliver material to wharves right along the route as it crosses Kent and tunnels beneath the Thames in its run into London.

Once the whole line is open in 2007, journey times between London and Paris will be cut to two hours 15 minutes, and Brussels should be possible in two hours. The Channel Tunnel itself will be only 35 minutes from London. The link is regarded as a marvel of modern engineering and construction. Its start point will be St Pancras International, which is destined to become Europe's largest passenger interchange, handling some 50 million passengers each year.



## London Olympics

Marine aggregates are set to play a key role in the staging of the 2012 Olympics. With construction activity focused heavily on east London, aggregate wharves along the Thames are particularly well placed to supply sand and gravel with minimal traffic impact. They will do so in tandem with land-based quarries and recycled aggregate plants, together supplying an estimated ten million tonnes of aggregate.

The Olympic stadium alone will cost £450 million and will seat 80,000 spectators. Meanwhile, the scruffier backwaters of the Lower Lea Valley will be revitalised to become a 200-hectare Olympic Park which will subsequently make way for one of Europe's largest regeneration projects. Once the athletes have gone, the converted Olympic village will provide 3,600 homes, many of which will be affordable. The area will also benefit from several new schools.

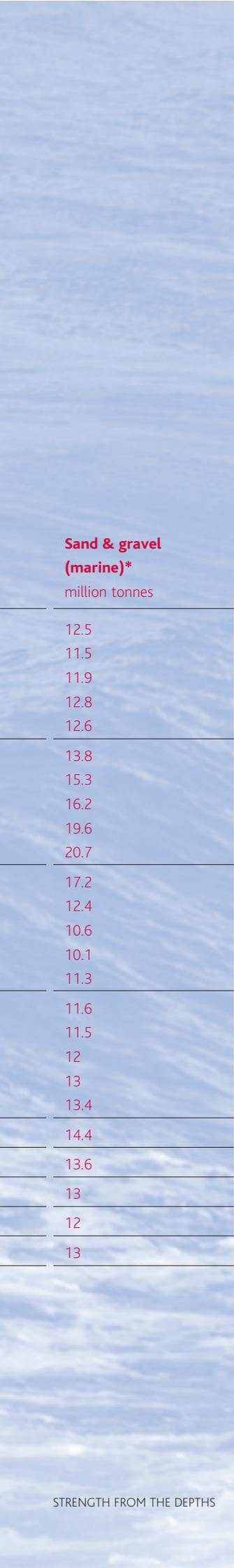
# Appendices

## Market summary 1980 - 2004

	<b>GDP</b> chained volume measures £m	<b>Construction output (GB)</b> £m 2000 prices	<b>Primary aggregate sales (GB)</b> million tonnes	<b>Crushed rock</b> million tonnes	<b>Sand &amp; gravel (total)</b> million tonnes
<b>1980</b>	607,787	50,728	199	103	96
	599,011	45,829	182	92	89
	610,489	47,487	194	103	91
	632,065	51,576	213	112	101
	648,325	53,627	211	111	100
<b>1985</b>	671,375	54,219	217	115	102
	697,894	56,178	228	123	106
	729,638	62,580	254	142	111
	765,932	68,616	291	162	130
	782,429	71,857	300	169	131
<b>1990</b>	788,152	72,085	278	162	116
	777,403	66,841	246	148	98
	779,563	64,033	233	144	89
	798,489	62,823	239	150	89
	833,681	62,589	259	162	98
<b>1995</b>	857,522	63,381	241	151	90
	880,854	65,776	215	133	82
	908,655	67,369	220	134	86
	938,101	68,411	218	132	86
	966,551	69,294	221	133	88
<b>2000</b>	1,005,542	69,676	219	130	89
<b>2001</b>	1,027,906	71,087	222	134	88
<b>2002</b>	1,048,456	74,090	210	127	83
<b>2003</b>	1,074,858	77,852	203	123	80
<b>2004</b>	1,108,890	80,254	214	128	86

Note: The 2004 primary aggregates sales volume from the Office for National Statistics (ONS) show an apparent 5% increase over 2003 volumes. We believe that the aggregates market was flat in 2004, compared with 2003, and that the apparent market increase recorded by the ONS is due to an increase in the survey sample used by the ONS. The ONS has so far not carried out any further analysis of their data to quantify the impact of this increased survey sample on 2004 volumes.

\*Marine sand and gravel volumes include only GB landings for construction purposes.



**Sand & gravel  
(marine)\***  
million tonnes

**Recycled/  
secondary (GB)**  
million tonnes (est)

**Total aggregates  
(GB)**  
million tonnes

**Asphalt (GB)**  
million tonnes

**Ready-mixed  
concrete (GB)**  
million cu m

12.5	20	219	24	22.4
11.5	18	200	22	19.9
11.9	19	213	26	20.7
12.8	21	234	27.2	21.5
12.6	21	232	25.5	20.8
13.8	22	239	26.9	21.6
15.3	23	251	28.4	21.5
16.2	25	279	29.9	24.3
19.6	29	320	31.8	28.8
20.7	32	332	33.7	29.6
17.2	33	311	36.7	26.78
12.4	34	280	36.4	22.53
10.6	35	268	36.6	20.78
10.1	37	276	36.3	20.77
11.3	39	298	37.7	22.93
11.6	42	283	34.9	21.68
11.5	45	260	29.3	20.89
12	48	268	27.5	22.33
13	51	269	27.7	22.93
13.4	54	275	26	23.55
14.4	57	276	25.7	23
13.6	60	282	26.5	23
13	62	272	27.8	22.54
12	64.5	268	27.8	22.3
13	67	281	26.9	23

# Appendices

## Marine Aggregate Summary Statistics 1998 - 2005

	<b>Area of seabed licensed for dredging (km<sup>2</sup>) *1</b>	<b>Area available to be worked (km<sup>2</sup>) *1</b>	<b>Area dredged (km<sup>2</sup>) *1</b>	<b>Quantity dredged (m tonnes) *2</b>
<b>1998</b>	1,458		222.6	20.47
<b>1999</b>	1,455		220.3	23.68
<b>2000</b>	1,464		155.4	20.68
<b>2001</b>	1,408	972	150.6	22.76
<b>2002</b>	1,359	896	149.8	21.93
<b>2003</b>	1,264	890	143.8	22.23
<b>2004</b>	1,257	780	134.5	21.45
<b>2005</b>	1,179	596	137.6	21.09

\*1 Extracted from 'Marine Aggregate Dredging - The Area Involved' annual reports published by BMAPA and The Crown Estate between 1998 and 2006 and 'Marine Aggregate Dredging Five Year Review - The Area Involved 1998 - 2002' published by BMAPA and The Crown Estate in 2005.

\*2 Extracted from annual 'Marine Aggregates, Crown Estate Licences, Summary Statistics' reports published by The Crown Estate between 1998 and 2006.

# BMAPA members and dredging fleet

## **Britannia Aggregates**

Britannia Beaver

## **CEMEX UK Marine**

Sand Harrier

Sand Heron

Sand Falcon

Sand Fulmar

Sand Serin

Sand Weaver

Welsh Piper

## **DEME Building Materials**

Charlemagne

## **Hanson Aggregates Marine**

Arco Adur

Arco Arun

Arco Avon

Arco Axe

Arco Beck

Arco Dart

Arco Dee

Arco Dijk

Arco Humber

## **Kendall Bros (Portsmouth)**

## **Lafarge Aggregates**

## **Northwood (Fareham)**

Donald Redford

Norstone

## **Norwest Sand and Ballast**

Sand Swan

## **United Marine Dredging**

City of Cardiff

City of Chichester

City of London

City of Westminster

## **Volker Dredging**





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BMAPA is one of the constituent bodies of the  
Quarry Products Association



**Providing Essential  
Materials for Britain**

The trade association for companies involved in supplying crushed rock and sand and gravel from land and marine sources, asphalt and flexible paving, ready-mixed concrete, silica sand, agricultural lime, industrial lime, mortar, slag, recycled materials and construction and quarrying plant