

3rd Devon Local Aggregate Assessment 2004-2013

First Draft

May 2014



Devon County Council County Hall Topsham Road Exeter Devon EX2 4QD	
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Cover photographs (© Devon County Council unless stated otherwise)

Top left: Processing of china clay waste for secondary aggregates, Lee Moor

Top right: Sand and gravel from the Budleigh Salterton Pebble Beds, Rockbeare Hill Quarry

Bottom left: Processing of construction and demolition waste for recycled aggregates, Trood Lane, Exeter

Bottom right: Working of limestone at Linhay Hill Quarry, Ashburton (© Dartmoor National Park Authority)

Acknowledgements

The assistance of Devon's mineral operators in providing the necessary data for the preparation of the Local Aggregate Assessment is gratefully acknowledged, as is the input of other stakeholders including other mineral planning authorities and interest groups.

Further Information

This Local Aggregate Assessment has been prepared by Devon County Council on behalf of the five Devon mineral planning authorities, and is based on aggregates data for the period to 31 December 2013. Reference should be made to Appendix A of the 1st Devon Local Aggregate Assessment for an explanation of the data collection methodology and use of weighted averages. All editions of the Local Aggregate Assessment are available at www.devon.gov.uk/laa

To discuss the Local Aggregate Assessment further, please contact Andy Hill of Devon County Council on 01392 383510 or minerals@devon.gov.uk

Further information on the Local/Minerals Plans being prepared by the Devon mineral planning authorities is available through the details provided below:

Dartmoor National Park Authority: <http://www.dartmoor-npa.gov.uk/planning/pl-forwardplanning>

Devon County Council: <http://www.devon.gov.uk/mineralsplan.htm>

Exmoor National Park Authority: <http://www.exmoor-nationalpark.gov.uk/planning/planning-policy>

Plymouth City Council:
<http://www.plymouth.gov.uk/homepage/environmentandplanning/planning/planningpolicy/ldf.htm>

Torbay Council:
<http://www.torbay.gov.uk/index/yourservices/planning/strategicplanning/newlocalplan.htm>

CONTENTS

EXECUTIVE SUMMARY	4
1. INTRODUCTION	5
2. DEVON'S GEOLOGY AND LAND-WON AGGREGATE RESOURCES	9
3. PAST AND CURRENT SUPPLY OF LAND-WON AGGREGATES	11
4. MARINE AND ALTERNATIVE AGGREGATES.....	20
5. USES AND MOVEMENT OF DEVON'S AGGREGATE RESOURCES.....	26
6. FUTURE AGGREGATES SUPPLY	32
7. REFERENCES	39
APPENDIX A: AGGREGATE FACILITIES IN DEVON.....	40
APPENDIX B: RECYCLED AGGREGATES DATA	42

EXECUTIVE SUMMARY

Devon's diverse geology results in a wide range of land-won aggregate resources being available. Waste materials from the quarrying of china clay, ball clay and slate produce secondary aggregates that, together with processing of construction, demolition and excavation waste for recycled aggregates, provide alternatives to the use of land-won aggregates. Sales of the different types of aggregates (estimated in the case of recycled aggregates) over the last ten years are illustrated below.

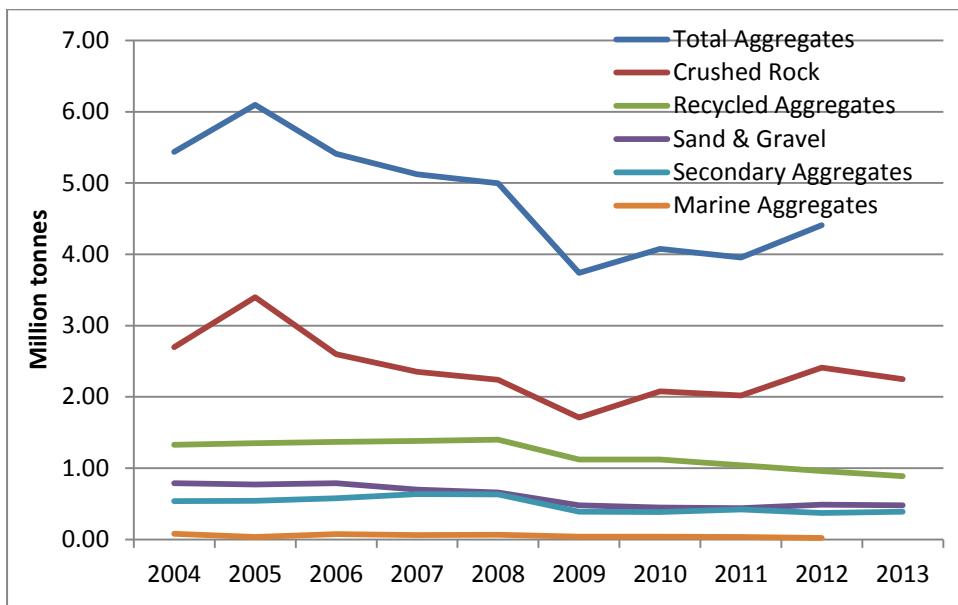


Figure ES.1: Total sales of aggregates in Devon, 2003-2012

These sales figures provide weighted ten year averages of:

Land-won crushed rock	2.23 million tonnes
Land-won sand and gravel	0.54 million tonnes
Recycled aggregates	1.11 million tonnes
Secondary aggregates	0.45 million tonnes
Marine aggregates	0.05 million tonnes

While the landbank for land-won crushed rock, at 62.5 years, extends well beyond the timescales of Devon's Minerals/Local Plans, land-won sand and gravel has a landbank of 15.1 years which indicates that Devon County Council may have to make additional provision if a minimum landbank of seven years is to be maintained for its Plan period to 2031.

There has been a trend over the past ten years towards the substitution of land-won aggregates by alternative aggregates, and evidence indicates that Devon has the capacity to support increased production of secondary and recycled aggregates.

In 2009, 87% of land-won and secondary aggregates produced in Devon were sold to destinations within the county, with most of the remainder going to adjacent counties. Significant imports of crushed rock took place from quarries in adjacent counties and to provide high-specification aggregates currently unavailable in Devon. Only small quantities of aggregates produced or consumed within Devon were transported by rail or sea.

1. INTRODUCTION

- 1.1 The National Planning Policy Framework [NPPF] [DCLG (2012)] introduced new arrangements for managing aggregates supply, including a requirement for the preparation of an annual Local Aggregates Assessment [LAA] by mineral planning authorities [MPAs] working individually or jointly. Following publication of the first LAA in February 2013 and the second edition in March 2014, this third edition provides updated information using data for the ten year period to the end of 2013.

Spatial Coverage of the Local Aggregate Assessment

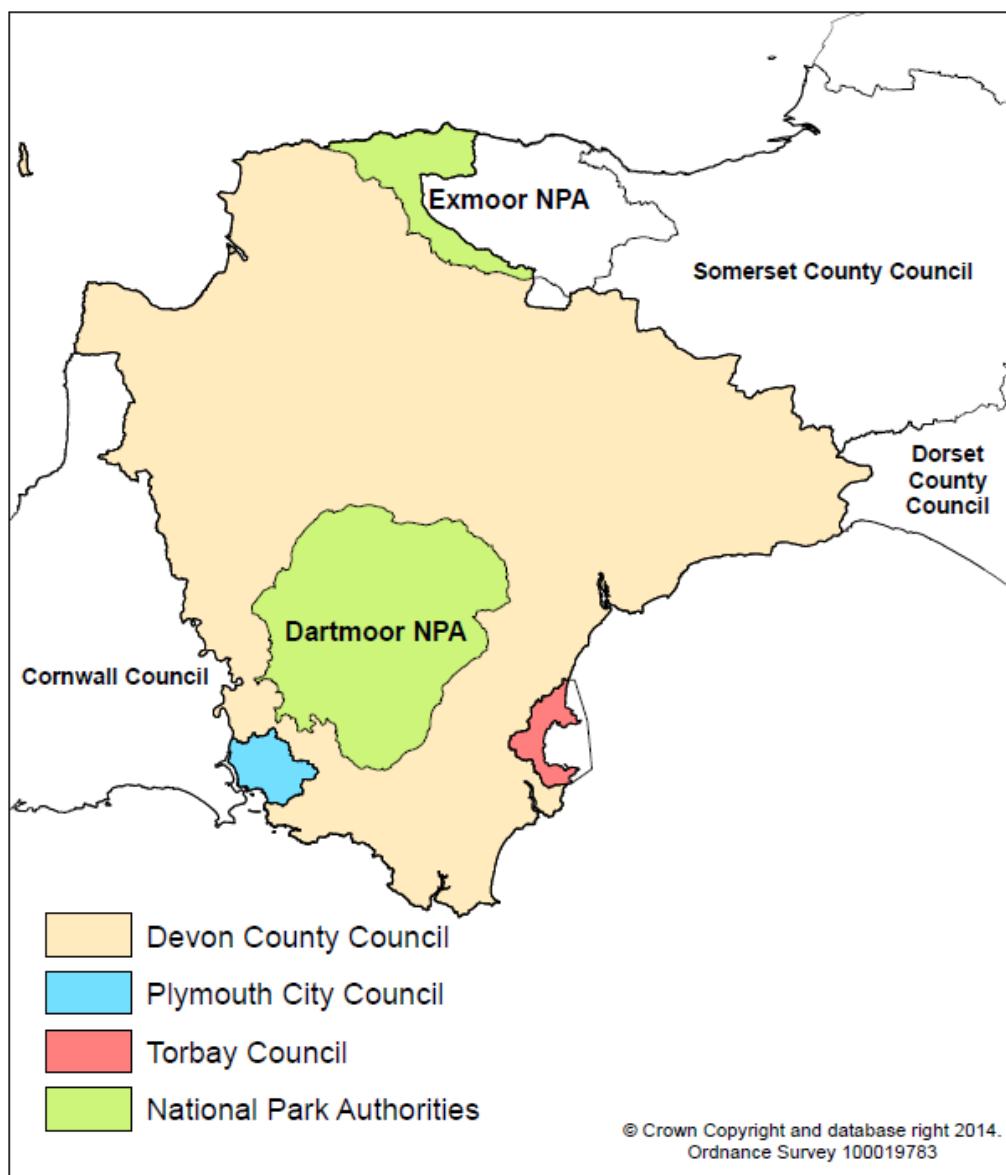


Figure 1.1: Mineral Planning Authorities in Devon and adjoining areas

- 1.2 The county of Devon comprises four separate MPAs – Devon County Council, Plymouth City Council, Torbay Council and Dartmoor National Park Authority – together with that part of the area covered by Exmoor National Park Authority lying within Devon (with the remainder of Exmoor falling within

Somerset and being included in the Somerset LAA), as shown by the coloured areas in Figure 1.1. The sub-regional apportionment of the National and Regional Aggregates Guidelines has traditionally used this ‘Devon’ grouping rather than individual MPAs, recognising the small number of quarries within some of the MPA areas and the close relationship between quarries and markets in those areas.

- 1.3 The LAA has been prepared by Devon County Council in discussion with the other Devon MPAs, and contributes to the evidence base for each of the five MPAs. For the purposes of this assessment, ‘Devon’ should be taken to refer to the historic county comprising the four whole MPAs and part of a fifth referred to in 1.2.

Timescale for the Local Aggregate Assessment

- 1.4 The Local Plans¹ prepared by Devon’s MPAs that collectively provide the county’s minerals planning policy framework have been, or are being, prepared to different time horizons:

Plymouth City Council ²	2006-2021
Dartmoor National Park Authority ³	2006-2026
Torbay Council ⁴	2006-2032
Exmoor National Park Authority ⁵	2011-2030
Devon County Council ⁶	2011-2031

- 1.5 It is considered appropriate for the LAA to look ahead to 2032 to ensure that it provides the necessary information for the longest of these time horizons, which will also help to inform MPAs preparing to review and replace their existing plans.

Purpose of the Local Aggregate Assessment

- 1.6 In the context of the guidance provided in the NPPF and DCLG’s Planning Practice Guidance⁷, it is considered that the purpose of the Devon LAA is to provide a rolling evidence base to inform the approach to be taken in the Local Plans of the individual MPAs to the supply of aggregates. This evidence should include information on:

- ♦ a forecast of the demand for aggregates based on a rolling average of 10 years sales data and other relevant information;
- ♦ an analysis of all aggregate supply options, including the extent of landbanks for land-won aggregates and availability of other forms of aggregates;

¹ The term ‘Local Plan’ includes Core Strategies and other Development Plan Documents

² Adopted Core Strategy and North Plymstock Area Action Plan

³ Adopted Core Strategy

⁴ Emerging Local Plan

⁵ Emerging Local Plan

⁶ Emerging Minerals Plan

⁷ Available at <http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/>

- ◆ an assessment of the balance between demand and supply, and the economic and environmental opportunities and constraints that might influence the situation.
- 1.7 The LAA does not itself propose the level or composition of aggregate supply to be delivered in Devon or identify the locations from which any new supply should be achieved. Such decisions are the responsibility of the individual MPAs to deliver through their Minerals/Local Plans, informed by the evidence presented in the LAA.
- 1.8 The LAA will continue to be published annually to inform development and monitoring of Local Plans, including recent sales and revisions to levels of reserves and the length of landbanks.

Definitions

- 1.9 This assessment uses the following terminology for aggregate resources:

Aggregates	Granular materials used in construction
Land-won aggregates	Aggregates quarried from limestone, sandstone and igneous/metamorphic rocks (collectively termed crushed rock) and from sand and gravel formations and superficial deposits (including beach and estuarial deposits)
Marine aggregates	Sand and gravel dredged from the sea
Secondary aggregates	Aggregates derived from the extraction and processing of non-aggregate minerals (e.g. china clay and ball clay), or as a by-product of industrial processes (e.g. blast furnace slag, incinerator bottom ash)
Recycled aggregates	Aggregates derived from the processing of inorganic construction, demolition and excavation waste [CDEW]
Alternative aggregates	A grouping of secondary and recycled aggregates

Abbreviations

- 1.10 The following abbreviations are used in this assessment:

AMRI	Annual Minerals Raised Inquiry
CDEW	Construction, Demolition & Excavation Waste
DCLG	Department for Communities and Local Government
HSA	High-specification Aggregate

*3rd Devon Local Aggregate Assessment – First Draft
May 2014*

LAA	Local Aggregate Assessment
MPA	Mineral Planning Authority
NPPF	National Planning Policy Framework
ODPM	Office of the Deputy Prime Minister
PSV	Polished Stone Value
RAWP	Regional Aggregate Working Party
SWAWP	South West Aggregate Working Party

2. DEVON'S GEOLOGY AND LAND-WON AGGREGATE RESOURCES

- 2.1 Devon has arguably the most diverse geology of any English county, resulting in a wide range of mineral resources having been exploited for use not only as aggregates but also for a range of industrial purposes, brick manufacture and as building stone.
- 2.2 Crushed rock aggregates are currently produced from a range of sandstone, limestone and igneous/metamorphic resources, while sand and gravel is quarried from various 'bedrock' deposits with no superficial deposits presently worked.
- 2.3 An assessment of the land-won and secondary aggregate resources in Devon [Scrivener, R & Miles, A J (2010)] was commissioned by Devon County Council, and reference should be made to this for a detailed account of current and potential resources. The resources yielding land-won aggregates within Devon in 2013, together with relevant quarries operational in that year, are outlined in Table 2.1.

Resource	Geological Formation	Quarries
Limestone	Chercombe Bridge Limestone (Devonian)	Linhay Hill
	East Ogwell Limestone (Devonian)	Stoneycombe
	Plymouth Limestone (Devonian)	Moorcroft
	Westleigh Limestone (Carboniferous)	Westleigh
Sandstone	Pickwell Down (Devonian)	Vyse
	Pilton Shales (Devonian / Carboniferous)	Bray Valley, Hearson
	Bude (Carboniferous)	Beam, Newbridge, Bableigh Wood
	Crackington (Carboniferous)	Knowle
Igneous / Metamorphic	Dolerite (Devonian / Carboniferous)	Whitecleaves
Sand and Gravel	Budleigh Salterton Pebble Beds (Triassic)	Rockbeare, Venn Ottery, Hillhead, Town Farm
	Upper Greensand (Cretaceous)	Zig Zag
	Aller Gravels (Eocene)	Zig Zag

Table 2.1: Land-won aggregate resources in Devon, 2013

- 2.4 The extent of the geological formations currently yielding sand and gravel, limestone and sandstone is illustrated in Figure 2.1, together with the location of aggregate quarries operational in 2013. While the extent of sandstone resources appears large, it should be noted that these are very variable in quality, and the outcrops with potential economic viability will be much more limited. No indication is given of the location of the currently quarried igneous and metamorphic rocks as their limited extent will not be apparent at this scale of mapping.

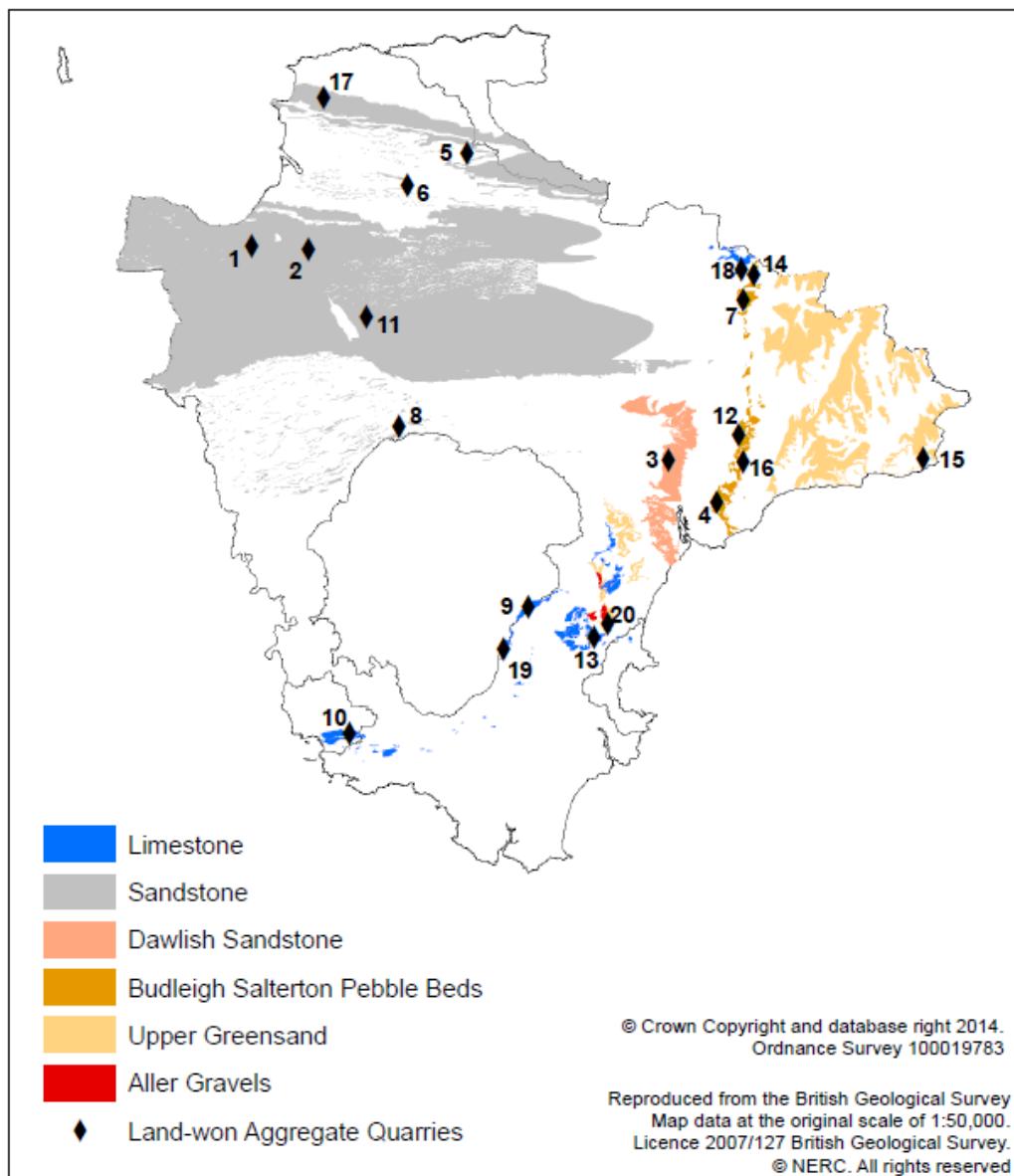


Figure 2.1: Location of currently-quarried geological formations and land-won aggregate quarries operational in 2013 (key to quarries in Appendix A)

- 2.5 Up to the early 2000s, sand and gravel had been worked from superficial deposits, notably the river terrace deposits of the Axe valley at Kilmington. While this and other river valleys in Devon have potential river terrace and alluvial resources, their commercial viability is restricted by their limited depth and areal extent. Similar constraints, together with environmental designations, limit the likelihood of estuarine dredging (formerly undertaken in the Taw/Torridge and Teign estuaries) recommencing.
- 2.6 Figure 2.1 illustrates the uneven distribution of aggregate resources within Devon, with sand and gravel formations occurring in the younger rocks of the south east of the county, and sandstone formations in the north west. The limestone resources that deliver the bulk of Devon's crushed rock output are clustered around Plymouth, Newton Abbot and adjacent to the Somerset border.

3. PAST AND CURRENT SUPPLY OF LAND-WON AGGREGATES

Past Sales of Land-won Aggregates

- 3.1 Sales of land-won aggregates originating within Devon over the 20 year period from 1994 to 2013 are shown in Figure 3.1⁸.

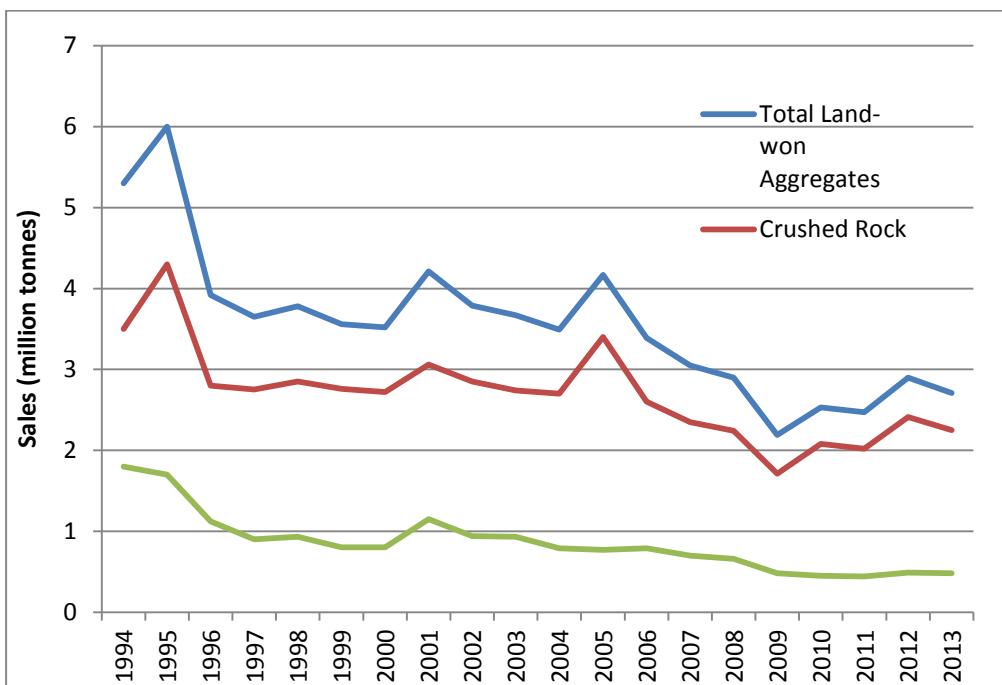


Figure 3.1: Sales of land-won aggregates in Devon (million tonnes), 1994-2013

- 3.2 While the early part of this period showed significant variation in sales of land-won aggregates, the years from 1996 onwards showed a steadier trend before a peak in 2001. Since 2001, sand and gravel sales have generally declined, remaining level from 2004 to 2006 but dropping more steeply in 2009 before levelling off. Crushed rock sales were broadly downward from 2001, with the exception of a notable peak in 2005 (understood to be related to major highway schemes that year), but generally increasing from 2010.
- 3.3 The NPPF requires an LAA to be based on a rolling average of sales over ten years, and sales figures for this period are provided in Table 3.1 and illustrated in Figure 3.2. These figures provide weighted ten year averages⁹ of 2.23 million tonnes for crushed rock [CR] and 0.54 million tonnes for sand and gravel [S&G]¹⁰.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
CR	2.70	3.40	2.60	2.35	2.24	1.71	2.08	2.02	2.41	2.25
S&G	0.79	0.77	0.79	0.70	0.66	0.48	0.45	0.44	0.49	0.48
Total	3.49	4.17	3.39	3.05	2.90	2.19	2.53	2.46	2.90	2.71

⁸ Sales figures are derived from survey work undertaken by Devon County Council using data provided by mineral operators as explained in Appendix A of the 1st LAA

⁹ See Appendix A of the First LAA for an explanation of the use of weighted averages

¹⁰ For comparison, the equivalent unweighted averages are 2.38 million tonnes for crushed rock and 0.60 million tonnes for sand and gravel.

Table 3.1: Sales of land-won aggregates in Devon, 2004-2013 (million tonnes)

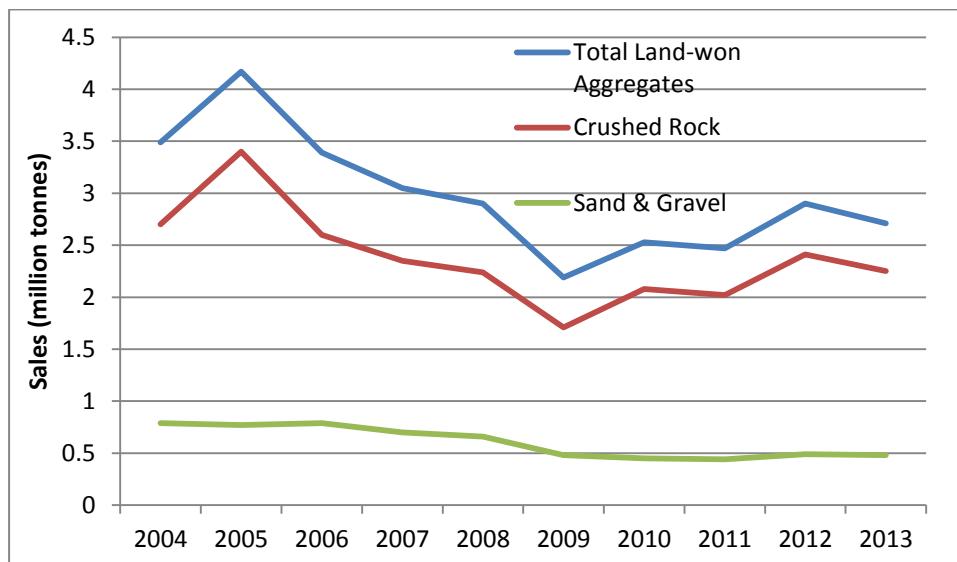


Figure 3.2: Sales of land-won aggregates in Devon, 2004-2013

- 3.4 During the past ten years, the proportion of land-won aggregates accounted for by crushed rock has increased from 77% to 82%, as illustrated in Figure 3.3 (a comparison of sales of land-won and other sources of aggregates is provided in Figures 4.2 and 4.3 later in this Assessment).

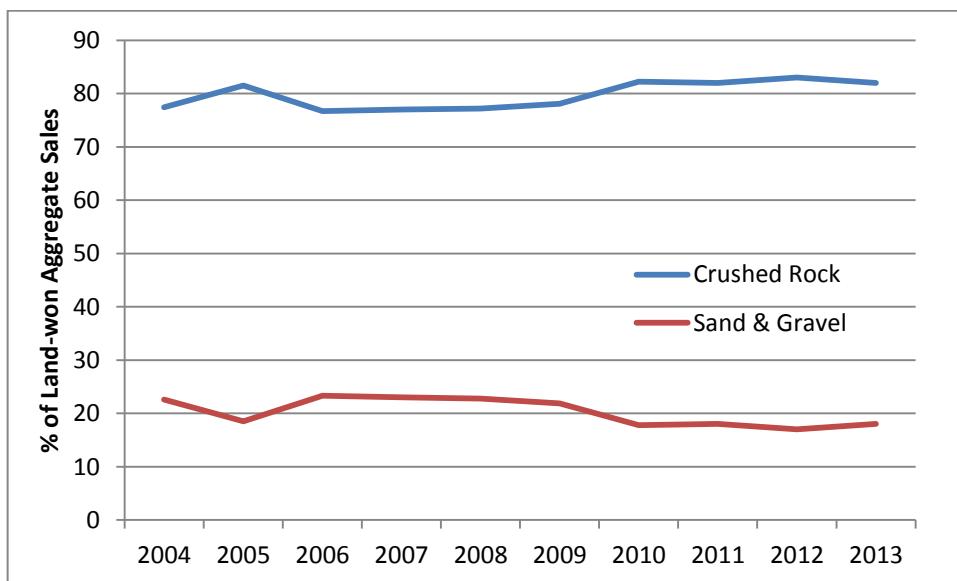


Figure 3.3: Share of Devon's Land-won Aggregate Production, 2004-2013

- 3.5 Over the past 10 years, the proportion of crushed rock aggregates sold in Devon accounted for by limestone has increased, reaching 87% in 2013. This reflects the lower levels of waste and ease of working in comparison with other rock types, together with the location of the limestone quarries in relation to the main settlements and transport routes. Figure 3.4 shows the proportions of crushed rock sales accounted for by the three types of rock.

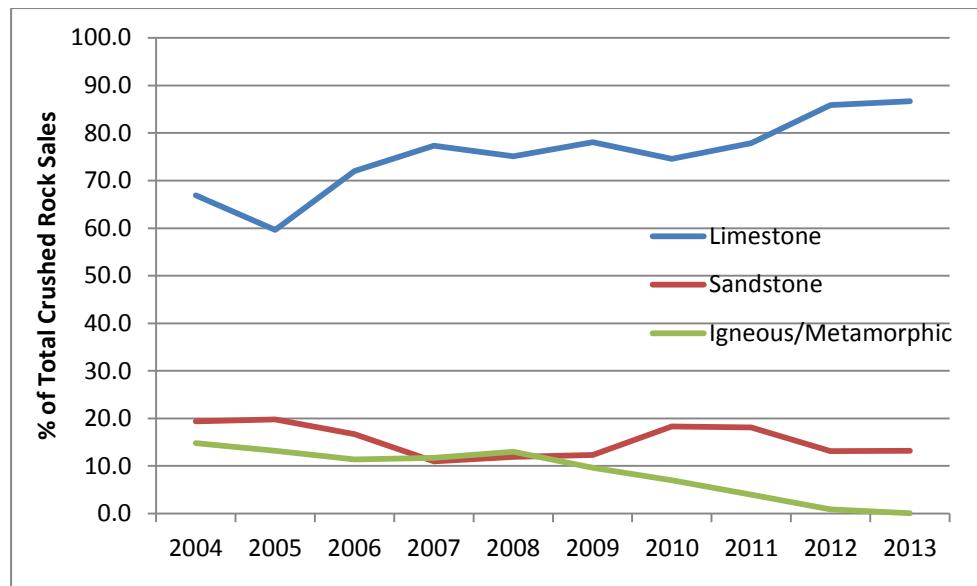


Figure 3.4: Share of Devon's crushed rock sales by rock type, 2004-2013

- 3.6 For sand and gravel, the proportion of sales derived from the Budleigh Salterton Pebble Beds has gradually increased during the last ten years to around 87%, as indicated in Figure 3.5. However, the relative proportions derived from the northern (i.e. Whiteball/Town Farm and Hillhead Quarries) and southern (i.e. Blackhill, Venn Ottery and Rockbeare Quarries) parts of the Pebble Beds have changed significantly as shown in Figure 3.6. While Hillhead Quarry was the largest contributor to supply from the Pebble Beds in the first part of the 10 year period, extraction has not been undertaken there in the second part, with sales limited to materials from stockpiles.

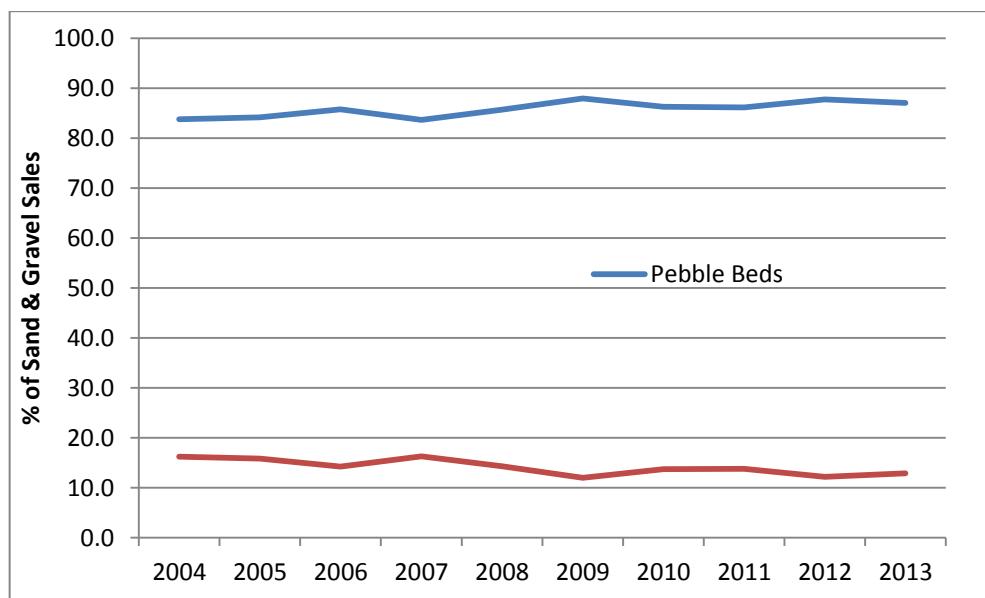


Figure 3.5: Share of Devon's sand and gravel sales by type, 2004-2013

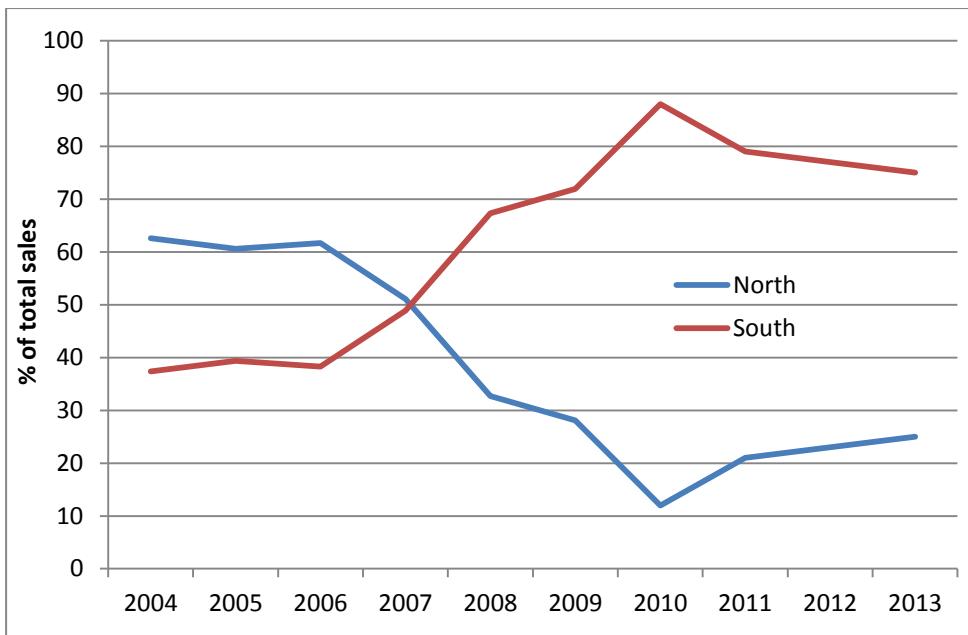


Figure 3.6: Relative proportions of sales from Budleigh Salterton Pebble Beds in northern and southern areas, 2004-2013

Comparison of Past Sales with Sub-regional Apportionments

- 3.7 Prior to the NPPF, the managed aggregates supply system comprised the publication of national and regional aggregates guidelines, and the sub-regional apportionment (generally to the county level) of the regional figures by the regional planning body in discussion with the Regional Aggregate Working Party [RAWP].
- 3.8 In the South West, the apportionment of the Government's regional guidelines for 2005-2020 was not formally completed following abolition of the regional planning body, although the RAWP provided its technical advice to the Secretary of State on an appropriate sub-regional apportionment.
- 3.9 Table 3.2 provides the sub-regional apportionment for Devon¹¹ of the national and regional guidelines for 2001 to 2016 and the RAWP's technical advice on the 2005-2020 guidelines.

2001-2016 Guidelines		2005-2020 Guidelines	
Crushed Rock	Sand & Gravel	Crushed Rock	Sand & Gravel
3.50	1.36	3.20	0.93

Table 3.2: Sub-regional aggregates apportionments for Devon (million tonnes)

- 3.10 A comparison of these apportionment figures with actual sales of land-won aggregates over the past ten years is given in Figure 3.7. This indicates that the only occasion that actual sales reached an apportionment level was the peak in crushed rock sales in 2005. The substantial gap between actual and forecast output from 2006 supports the use of an average of past local sales, rather than sub-regional apportionments based on nationally-generated figures, as a basis for future provision.

¹¹ For sand and gravel, the apportionment groups Devon with Cornwall and Somerset due to the low production levels in those counties

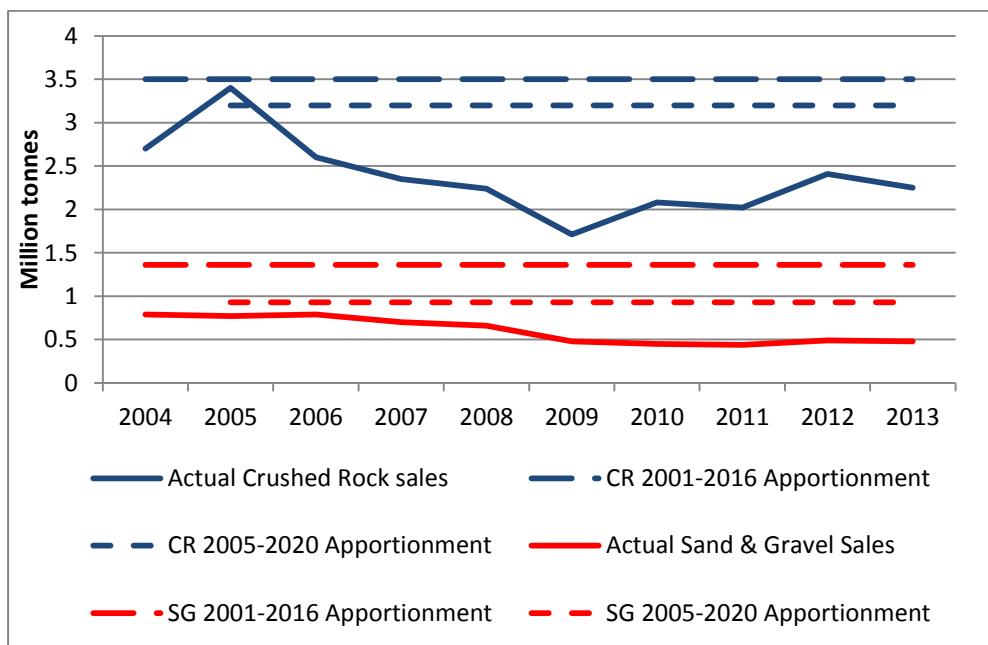


Figure 3.7: Comparison of land-won aggregate sales 2004-2013 and Devon's sub-regional apportionments (million tonnes) (CR – Crushed Rock; SG – Sand & Gravel)

Current Availability of Land-won Aggregate Resources

- 3.11 Devon's existing aggregate quarries have substantial permitted reserves of crushed rock aggregates, but more limited reserves of sand and gravel. Table 3.3 shows the permitted reserves available at 31st December 2013 in Devon¹².

Resource		Permitted Reserves (million tonnes)
Crushed Rock	Limestone	82.250
	Sandstone	18.474
	Igneous/Metamorphic	38.583
	Total Crushed Rock	139.306
Sand & Gravel		8.135

Table 3.3: Permitted reserves of primary aggregates in Devon at 31 December 2013

- 3.12 The NPPF seeks the maintenance of landbanks of land-won aggregates of at least seven years for sand and gravel and at least ten years for crushed rock. Using the weighted averages of sales over the past ten years (2004-2013) as indicated in paragraph 3.3, the land-won aggregate landbanks at the end of 2013 can be calculated from these permitted reserves as follows¹³:

Crushed rock landbank 62.5 years

Sand and gravel landbank 15.1 years

¹² Excluding Dormant sites

¹³ For comparison, landbanks calculated using the unweighted averages identified in footnote ¹⁰ are 58.5 years for crushed rock and 13.6 years for sand and gravel.

The Crushed Rock Landbank

- 3.13 The crushed rock landbank is well in excess not only of the ten year minimum required by the NPPF, but also the time horizons of the adopted or emerging Minerals/Local Plans of the Devon MPAs. As shown in Table 3.4, substantial landbanks exist for the individual types of crushed rock.

Resource	10 Year Weighted Average Production (million tonnes)	Landbank (Years)
Limestone	1.76	46.7
Sandstone	0.34	54.3
Igneous/Metamorphic	0.14	275.6

Table 3.4: Landbanks for crushed rock aggregates in Devon at 31 December 2013

- 3.14 While the overall crushed rock landbank is extensive, there are limited available reserves of high-specification aggregates [HSAs] from Devon's operational quarries. HSAs provide materials with polished-stone values [PSV] in the mid to high 60s that are suitable for skid-resistant road-surfacing. Within Devon, only Bray Valley Quarry (sandstone) and Blackhill Quarry (processing materials extracted elsewhere in the Budleigh Salterton Pebble Beds) are currently producing materials with a PSV above 60. A further significant source of HSAs for the Devon market is Pigsdon Quarry in Cornwall, located close to the Devon boundary near Bude, while HSAs have also been transported from quarries elsewhere in England and in South Wales and Ireland.
- 3.15 Research [Thompson *et al* (2004)] indicates that Devon's sandstone resources, notably the Bude Formation that outcrops between the Cornwall border and the Exe Valley, are capable of yielding HSAs with PSV above 60 and, in some cases, above 65. While Scrivener & Miles (2010) identified those parts of the Bude and Crackington Formations with potential for high-PSV resources, these areas will need further refinement through site investigation by the minerals industry before the presence of economic resources can be established. The recent airborne survey work undertaken for the Tellus SW Geophysical Survey may enable the British Geological Survey to refine their mapping of the northern Devon sandstones to assist in identifying formations with potential for high-PSV resources¹⁴.
- 3.16 The NPPF (paragraph 145) suggests the use of separate landbanks for "aggregate materials of a specific type or quality which have a distinct and separate market", which could encompass HSAs. However, the variability of sandstone resources within a quarry renders it difficult to calculate specific reserves for HSAs, while there are confidentiality issues with identifying a landbank to which a limited number of quarries contribute. It is therefore not proposed to identify a separate landbank for HSAs, but the delivery of further resources will be an issue to be addressed in Devon County Council's Minerals Plan¹⁵.
- 3.17 The current round of periodic reviews of mineral permissions required by Schedule 14 of the Environment Act 1995 is seeing a small number of

¹⁴ Further information on Tellus SW is available at <http://www.tellusgb.ac.uk>

¹⁵ Potential HSA resources in Devon are limited to the north and west of the county within the area for which Devon County Council is MPA

permissions for crushed rock quarries lapsing due to operators or landowners not submitting new working schemes. However, the considerable length of the crushed rock landbank provides an adequate buffer to ensure it can be maintained for at least the Plan periods for Devon's MPAs.

The Sand and Gravel Landbank

- 3.18 In contrast to the position with crushed rock, the landbank for sand and gravel calculated using the weighted average of sales over the past ten years, although greater than the seven years minimum required by the NPPF, does not extend to the 2031 end date of Devon County Council's emerging Minerals Plan¹⁶.
- 3.19 While some MPAs distinguish between sharp sand and soft sand in their landbanks and LAA, the nature of Devon's sand and gravel resources does not warrant such a distinction, with resources such as the Budleigh Salterton Pebble Beds and Aller Gravels being capable of providing concreting (sharp) and building (soft) sand together with gravel fractions. Paragraph 145 of the NPPF does, however, also highlight that longer periods for landbanks may be warranted to take account of "locations of permitted reserves relative to markets".
- 3.20 Reflecting the pattern of sand and gravel production highlighted in paragraph 3.6, approximately 90% of the current sand and gravel reserves are located within the Budleigh Salterton Pebble Beds. However, the major proportion of these are located within the northern area of the Pebble Beds (i.e. Town Farm and Hillhead quarries) with more limited reserves remaining in the southern area. Devon County Council has consulted on options for the spatial pattern of sand and gravel production [Devon County Council (2011)], and its emerging Minerals Plan will need to consider the relationship between the location of the reserves making up the landbank and the spatial pattern of working to be pursued.
- 3.21 Potential constraints on the maintenance of the sand and gravel landbank are (a) the limited duration of planning permissions for some of the existing quarries, and (b) the scope for permissions to lapse if the periodic review schemes required by Schedule 14 of the Environment Act 1995 are not submitted. While there are opportunities for operators to seek the extension of these time limits, failure to do so would lead to lapsing of planning permissions and consequent loss of permitted reserves. Table 3.5 identifies those sand and gravel reserves for which planning permission is due to expire prior to 2031.

Quarry	Permission Time Limit
Babcombe Copse/Sands Copse	21 st February 2015
Rockbeare (Marshbroadmoor)	25 th April 2015
Hillhead (Houndaller)	31 st December 2018
Uplyme	31 st December 2019
Zig Zag	31 st December 2020
Haldon	31 st December 2022
Town Farm	27 th June 2023

Table 3.5: Sand and gravel planning permission expiry dates

¹⁶ The absence of sand and gravel resources from Plymouth, Torbay and the two National Parks limits the scope of existing and potential supply to the area for which Devon County Council is the MPA

- 3.22 For most of the quarries listed in Table 3.5, the extent of remaining reserves and recent levels of sales suggest that the reserves will be worked out by the expiry date. However, as indicated in Table 3.6, no extraction has taken place over the last four calendar years at Hillhead, Haldon or Babcombe Copse/Sands Copse, and it may therefore be the case that, unless working recommences at these sites, some or all of their remaining reserves will ‘disappear’ unless permission is obtained to extend the current consent.

Quarry	Resource	Current Status
Babcombe Copse / Sands Copse, Kingsteignton	Upper Greensand & Aller Gravels	Inactive with no extraction since 2009. The previous operator surrendered the lease in May 2012 following removal of plant, but a new operator is due to commence working in 2014.
Bishop's Court, Exeter	Dawlish Sandstone	Site sold for non-mineral development, with sale of stockpiled sand ceasing in February 2013.
Blackhill, Woodbury	Budleigh Salterton Pebble Beds	Extraction of remaining reserves was completed in 2011. Plant is retained for processing materials transported from two other sites until December 2016.
Haldon, Kennford	Haldon Gravels	Inactive since 2005, since when the site has changed hands. An application for a revised working scheme and increased annual output was approved in April 2013.
Hillhead, Uffculme	Budleigh Salterton Pebble Beds	No extraction undertaken since 2009, although small quantities have been sold from stockpiles. Renewed extraction of sand and gravel at Houndaller is being considered for 2014.
Rockbeare Hill, Rockbeare	Budleigh Salterton Pebble Beds	Limited remaining reserves are being worked on a campaign basis in 2014 and transported to Blackhill for processing.
Town Farm, Burlescombe	Budleigh Salterton Pebble Beds	Working has moved into the extension area approved in 2010. Materials are transported to Whiteball (Somerset) for processing.
Uplyme	Upper Greensand	No extraction of sand and gravel is currently undertaken, but small quantities are taken from a stockpile of previously-excavated material. Working of the overlying chalk for agricultural purposes continues.
Venn Ottery	Budleigh Salterton Pebble Beds	Extraction recommenced in April 2011, with materials transported to Blackhill for processing.
Zig Zag, Kingskerswell	Upper Greensand & Aller Gravels	Extraction continuing with processing on site.

Table 3.6: Status of permitted sand and gravel sites in Devon

- 3.23 Town Farm forms part of Hanson’s Whiteball operation, for which the processing plant lies in Somerset adjacent to its border with Devon. In recent years, virtually all extraction of sand and gravel for Whiteball has taken place

within Devon, most recently at Town Farm where planning permission was granted in 2010 for an extension with an anticipated life of ten years¹⁷.

- 3.24 Following completion of extraction at Town Farm, it is anticipated that the Whiteball processing plant will be supplied from materials extracted in Somerset, for which Somerset County Council's current Minerals Local Plan identifies a Preferred Area and an Area of Search. Somerset County Council published its Pre-submission Minerals Plan in March 2014 [Somerset County Council (2014)], which included the following policy:

“Policy SMP4: Provision of sand and gravel

Land adjacent to Gipsy Lane, Greenham has been identified as a Preferred Area and an Area of Search as shown in Map 2 to contribute towards sand and gravel supply in conjunction with Devon County Council.

Planning permission for the extraction of sand and/or gravel in Somerset which is outside the Preferred Area and Area of Search will be granted subject to the applicant demonstrating that the proposed site offers net environmental benefits over those within the Preferred Area or Area of Search”

- 3.25 This suggests that, during the later part of the period to 2031 covered by the LAA, some of the sand and gravel supply previously delivered from Devon will be met from Somerset through continued working at Whiteball.
- 3.26 However, this supply from Somerset will be offset by the likely cessation of supply of sand and gravel from Dorset, as Chard Junction Quarry, located close to the boundary with Devon (see Figure 6.1) and supplying materials into the east of the county, is anticipated to cease working in 2022/23.

¹⁷ The application identified a reserve of 2 million tonnes with an annual extraction rate of 200,000 tonnes

4. MARINE AND ALTERNATIVE AGGREGATES

- 4.1 In addition to its resources of land-won aggregates, Devon is able to utilise a range of other aggregate resources:
- ◆ marine sand and gravel dredged from the Bristol Channel and landed in northern Devon in small quantities for the local market;
 - ◆ secondary aggregates from the processing of waste from china clay operations at Lee Moor and, to a lesser extent, from ball clay in the Bovey Basin and slate waste at Mill Hill Quarry; and
 - ◆ recycled aggregates from the processing of CDEW at a network of recycling facilities, some of which are located at operational quarries, and at construction sites.

- 4.2 This part of the assessment reviews the nature of these sources of aggregates, their recent levels of supply and the current availability of resources and/or capacity for their processing.

Marine Aggregates

- 4.3 Small quantities of marine-dredged sand and gravel originating from the Bristol Channel are landed at Appledore and Yelland, and sold to the local North Devon market. The total quantity landed in 2013 amounted to [figure not yet available] tonnes. The weighted ten year average landings of marine aggregates for Devon is [figure to be calculated when 2013 data available] tonnes (rounded to [??] million tonnes). This resource thus makes only a small contribution to Devon's aggregates supply (around 1%), in contrast to the national picture whereby 21% of England and Wales' sand and gravel supply is from marine sources [Mineral Products Association (undated)].
- 4.4 Marine aggregates are landed in greater quantities at ports in Somerset and Dorset, but are understood not to supply markets in Devon to any significant degree.
- 4.5 The two main constraints on the level of marine aggregate supply are the extent and location of licensed dredging areas and the capacity of wharves for landing the materials.

Licensed Dredging Areas

- 4.6 Dredging for marine aggregates is licensed by the Crown Estate, which licenses several areas within the Bristol Channel including that from which materials are landed at Appledore. Within the English Channel, the closest licensed area to Devon is just west of the Isle of Wight, but no materials from this area are landed at any port west of Poole.
- 4.7 The Crown Estate's statistical summary for 2012 [Crown Estate (2012)] indicates that 1.07 million tonnes were dredged that year from the Bristol Channel, amounting to 34.4% of the annual licensed tonnage, with 0.43 million tonnes being landed at English wharves, of which Avonmouth accounted for the majority, and the remainder in Wales. The intensity of use

of the licensed areas would therefore not appear to be an obstacle to an increased level of dredging to supply Devon if demand warranted it.

Wharf Capacity

- 4.8 No figures are available on the maximum annual throughput of the wharves at Appledore and Yelland that are, or have been, used for landing marine aggregates. However, there are three wharves within the port of Appledore that have been used for unloading marine aggregates in greater quantities than is the case recently, which suggests that, together with the additional capacity at Yelland, adequate capacity is available provided that these remain unconstrained by other development.

Secondary Aggregates

- 4.9 The major source of secondary aggregates in Devon over the past ten years is the waste derived from the extraction and processing of china clay in the Lee Moor area of Devon, which accounts for 80-90% of the county's production of secondary aggregates. For each tonne of saleable china clay, up to nine tonnes of waste are produced, with two main elements capable of use as secondary aggregate:
- ◆ stent (waste rock), which can be used as general fill or, after crushing and screening, for other aggregate purposes; and
 - ◆ tip sand (washed material comprising quartz, unaltered feldspar and mica) which, with grading and washing, can be used for a variety of aggregate purposes including concrete, road sub-base and building sand.
- 4.10 In previous years, secondary aggregate operations at china clay sites have been fed from 'as dug' materials, and this remains the case with Tarmac's operation at Headon. Since the contraction of Imerys' Lee Moor china clay operations, Aggregate Industries have supplemented 'as dug' materials with processing of materials from a waste tip under a planning permission granted in 2009, with an estimated five million tonnes to be worked over 20 years.
- 4.11 Within the ball clay workings of the Bovey and Petrockstowe Basins, sand occurs as interburden within the clay seams and has been tipped as waste. Sand from the Bovey Basin is processed for secondary aggregate and horticultural use by Sibelco at their Preston Manor works.
- 4.12 Mill Hill Quarry works slate for building stone purposes, and processes some of the waste materials for secondary aggregate purposes, albeit on a small scale in comparison with the china clay secondary aggregate operations.
- 4.13 The annual sales of secondary aggregates over the past ten years shown in Table 4.1 give a weighted average of 0.45 million tonnes, although they have been at a lower level from 2009. Figure 4.1 illustrates these sales alongside those for marine-dredged and recycled aggregates.

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
0.54	0.54	0.58	0.63	0.63	0.39	0.39	0.42	0.37	0.39

Table 4.1: Sales of secondary aggregates in Devon, 2004-2013 (million tonnes)

- 4.14 In addition to the existing sources of secondary aggregates outlined above, other potential sources that may be available from within Devon in the future in the event of planned developments proceeding are:
- ♦ the recycling of incinerator bottom ash derived from waste incineration in Devon, with the Exeter and Plymouth energy from waste facilities due to open in 2014/15 (although no facility for the processing of this material currently exists within Devon); and
 - ♦ secondary aggregates from the processing of waste from tungsten and tin extraction at Hemerdon, near Plymouth, which is anticipated to commence extraction from 2015.
- 4.15 A further source of secondary aggregate imported into Devon at present is blast furnace slag from Port Talbot in South Wales. This is transported by sea and landed at Teignmouth for use as a cement additive/substitute, and is also capable of use as an aggregate.
- 4.16 The location of the facilities for production of secondary aggregates is illustrated in Figure 4.4. With production of land-won sand and gravel concentrated in the eastern part of Devon, the china clay operations in the Lee Moor area are well-placed to supply sand and other secondary aggregates to Plymouth and south west Devon.
- 4.17 Potential physical constraints on future growth in the level of supply of secondary aggregates include the continued availability of raw materials for processing and the capacity of the processing plant. However, neither of these are anticipated to limit potential growth in secondary sales in Devon due to the ready availability of tipped waste materials in addition to 'as dug' material, together with the spare capacity of plant.

Recycled Aggregates

- 4.18 The waste arising from construction, demolition and excavation activity comprises a range of materials, of which the 'hard inert' elements (e.g. concrete, bricks, stone, road planings, rail ballast and glass) can be recycled for use as aggregates. Other elements of CDEW, due to their 'soft' and/or organic nature (e.g. soil, timber and plasterboard), are unsuitable for aggregate use but can be recovered or recycled for other beneficial uses. Recent national reports on CDEW have estimated that around 45% of the total arisings have been recycled for aggregate use.
- 4.19 Robust data on arisings of CDEW and the quantities of recycled aggregates derived from it are difficult to obtain, particularly for the county level. It is disappointing that the Government has not undertaken any recent surveys of these materials, and that some minerals and waste operators have not responded to surveys by Devon County Council. Estimates have therefore been developed from previous national and regional surveys, with assumptions made about the proportions produced in Devon, together with the partial results of the County Council's surveys. The methodology used to calculate recycled aggregate sales in this iteration of the LAA differs from that used in previous years, and this is explained in Appendix B. The resulting figures for the past ten years are provided in Table 4.2, with the weighted ten year average being 1.11 million tonnes.

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1.33	1.35	1.37	1.38	1.40	1.12	1.12	1.04	0.96	0.89

Table 4.2: Estimated sales of recycled aggregates in Devon, 2004-2013 (million tonnes)

- 4.20 The gradually increasing sales in recycled aggregates from 2004 to 2008 suggested by these estimated figures appears to be the result of a balance between a generally downward trend in the annual arisings of CDEW, due to more efficient site management, and an increasing rate in the proportion of waste that is recycled. The latter factor is likely to have been influenced by the dual fiscal measures of the Aggregates Levy and Landfill Tax.
- 4.21 From 2008 onwards, a levelling off in the rate of recycling combined with a reduction in the volume of waste generated by the construction sector has resulted in lower sales of recycled aggregates, reflected in a similar pattern for secondary aggregates. However, it should be recognised that, unlike secondary aggregates for which reliable data are available, analysis of trends in recycled aggregate sales is hindered by the poor data available.
- 4.22 Figure 4.1 illustrates the levels of sales of recycled, together with marine and secondary, aggregates over the past ten years.

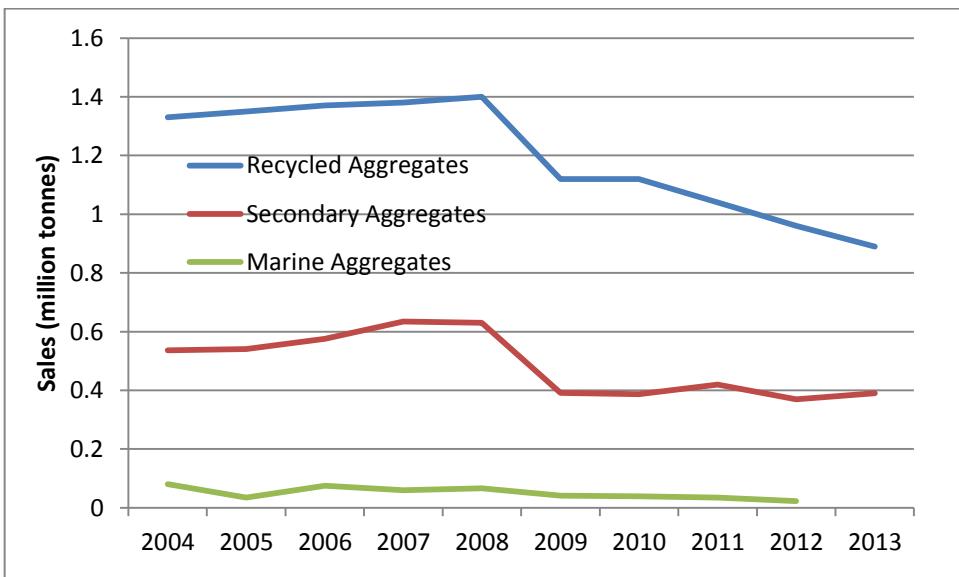


Figure 4.1: Sales of Marine and Alternative Aggregates in Devon (million tonnes), 2004-2013

- 4.23 To enable comparison of trends for land-won, marine and alternative sources of aggregates, Figure 4.2 illustrates the total annual sales for each aggregate stream, while Figure 4.3 shows the proportion of the total aggregate sales accounted for by each stream. The key points from these Figures is that the sales of recycled aggregates and, to a lesser extent, secondary aggregates have achieved an increasing share of the total aggregates market from 2005 (although declining from 2009), while crushed rock's share of the market has remained around 50% despite declining sales levels to 2009. Land-won sand and gravel has seen a gradual decline in its share of Devon's aggregates market from 16% in 2002 to 12% in 2013, while marine sand and gravel's contribution to supply has remained tiny in comparison with other aggregates (albeit remaining an important resource for the local North Devon market).

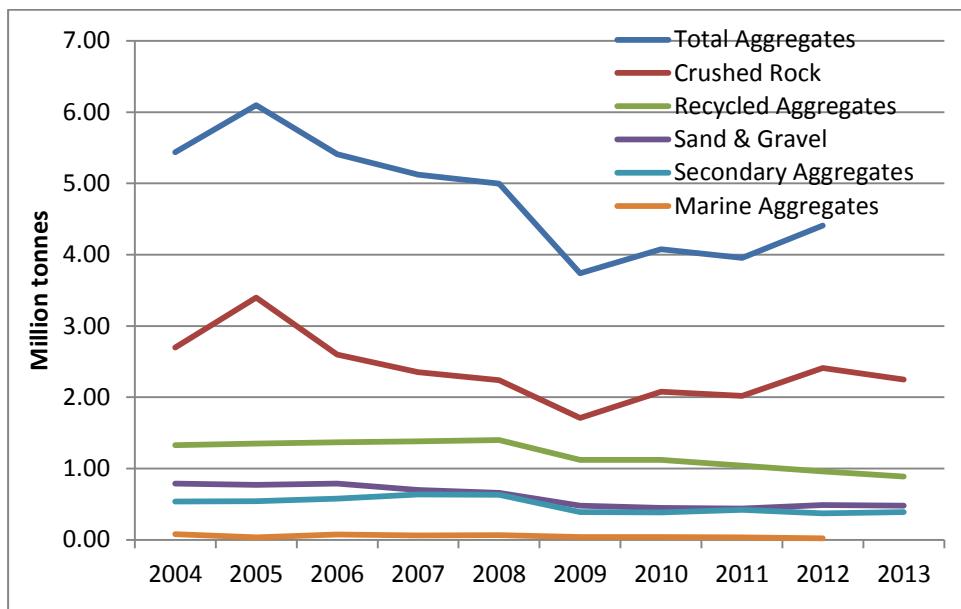


Figure 4.2: Total sales of land-won, marine and alternative aggregates in Devon, 2004–2013

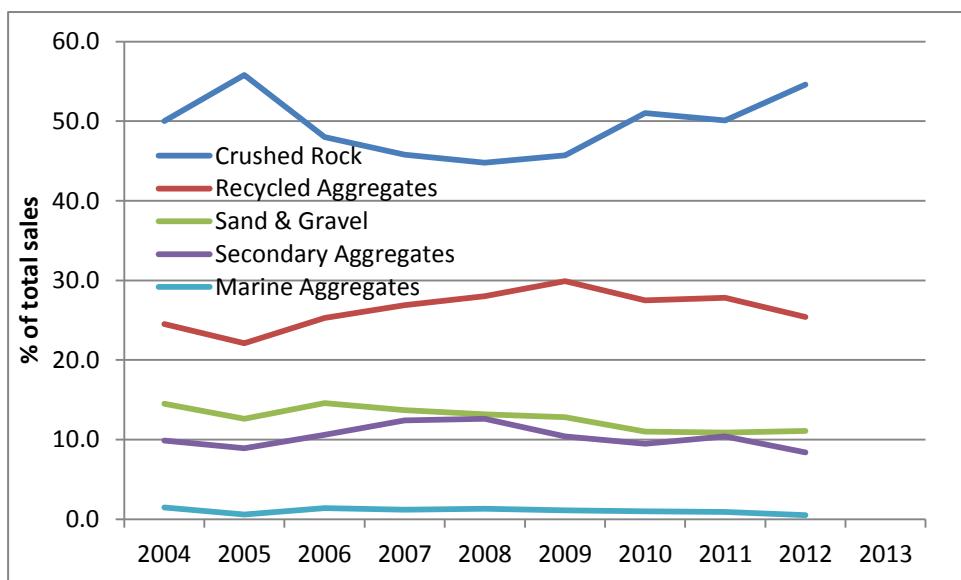


Figure 4.3: Relative sales of land-won, marine and alternative aggregates in Devon, 2004–2013

- 4.24 The recycling of CDEW in Devon is undertaken at two main types of site:
- ◆ fixed recycling sites, usually at a quarry, inert landfill site or waste transfer station, with aggregates sold on the open market and/or utilised in materials such as concrete produced at the same site; and
 - ◆ temporary construction sites, with mobile plant being used to process the materials arising from demolition for use either on the same site (e.g. as construction fill or hardcore) or for sale off-site.
- 4.25 The distribution of facilities for the production of recycled and secondary aggregates, together with wharves for landing marine aggregates, is indicated in Figure 4.4. Recycled aggregate facilities are generally clustered close to

the main urban areas of Plymouth, Torbay/Newton Abbot, Exeter and Barnstaple, providing a comprehensive network that helps in providing local supplies.

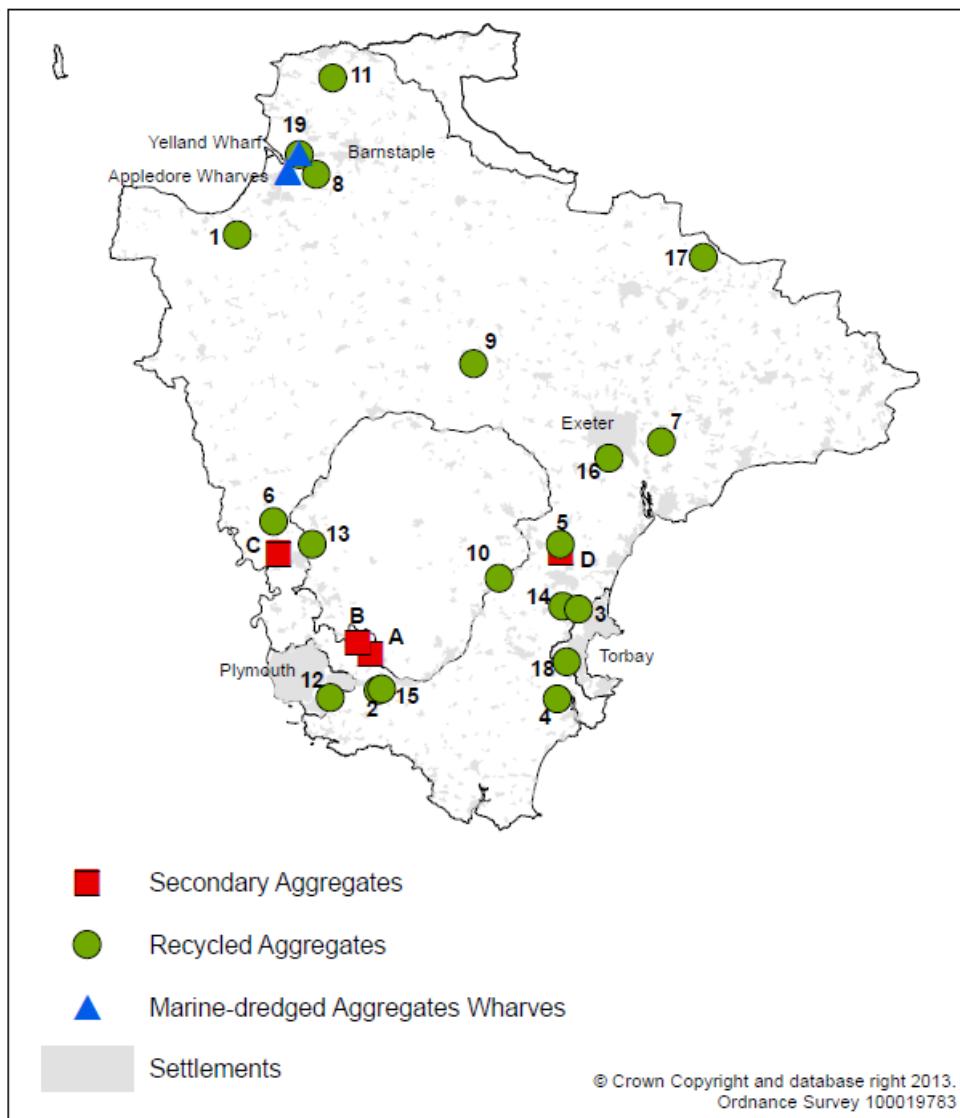


Figure 4.4: Location of secondary and recycled aggregate facilities and marine-dredged aggregate wharves operational in 2013 (key to sites in Appendix A)

- 4.26 Analysis based on a partial survey of recycling site operators together with review of limits in planning permissions and/or environmental permits suggests that Devon's operational CDEW recycling sites have a capacity for production of recycled aggregates in the region of 2 million tonnes. This capacity is comfortably above the highest annual production given in Table 4.2, although it should be borne in mind that fixed recycling sites only account for a proportion (estimated at two thirds) of the total volume of recycled aggregates produced in Devon. The existing fixed recycling sites therefore have substantial spare capacity to cater for any increased demand that may occur in the future.

5. USES AND MOVEMENT OF DEVON'S AGGREGATE RESOURCES

- 5.1 The first iteration of the Devon LAA included detailed information on the uses to which Devon's aggregates are put and the pattern of movements of aggregates between Devon and other areas. This information was based on data obtained for the last Aggregate Minerals survey in 2009 (AM2009), with the next survey due to occur in early 2015, based on data for 2014.
- 5.2 The first LAA also included information on mineral traffic at Devon's ports drawn from a 2010 report prepared for Plymouth City Council.
- 5.3 While the second LAA repeated this information from the first iteration, there seems little merit in further repetition in this third LAA. This chapter will therefore summarise the main points on the uses and movement of Devon's aggregates, and readers are advised to view the second LAA if they require more detail on these issues.

Uses of Devon's Aggregate Resources

- 5.4 Aggregates are used for a wide range of construction uses, with concrete (both ready-mixed concrete and the manufacture of concrete products) and road construction and maintenance being the major uses for Devon's land-won and secondary aggregates. Other uses include mortar, armourstone, rail ballast and constructional fill.
- 5.5 As explained in more detail in British Geological Survey (2007), an aggregate's suitability for a specific use is dependent on its physical and mechanical attributes, including strength, durability, porosity, particle shape, presence of impurities and abrasion resistance. The desired combination of these qualities will vary between different uses, with the most stringent specifications for structural concrete and road surfacing only capable of being met by a limited range of aggregate resources. For lower-specification uses, requirements can be met by a wider range of materials including secondary and recycled aggregates.
- 5.6 In addition to the relative physical properties, the choice of aggregate to be used for a particular purpose will also be influenced by matters such as ease of working and the proportion of waste generated, together with economic factors including proximity of the resource to markets (influencing transport costs), fiscal measures such as the Aggregates Levy, and the compliance of alternative aggregates with technical standards.
- 5.7 The AM2009 survey provided an indication of the uses to which Devon's aggregates were put:
 - ◆ the main use for land-won sand and gravel was for concrete (66%), with the other main uses being other screened and graded gravels (17%), asphalt (12%) and mortar (4%);
 - ◆ crushed rock had a more diverse range of uses, the main ones being concrete (24%), uncoated roadstone (23%), asphalt (17%), other

- screened and graded aggregates (16%), rail ballast and armourstone (2%) and other constructional uses (18%);
- ◆ secondary aggregates were mainly used for concrete (69%), with other uses being screened and graded aggregates (17%), road construction (5%) and other constructional uses (11%).
- 5.8 The limited quantity of marine-dredged sand and gravel was used for concrete, but no data are available for the uses of recycled aggregates.

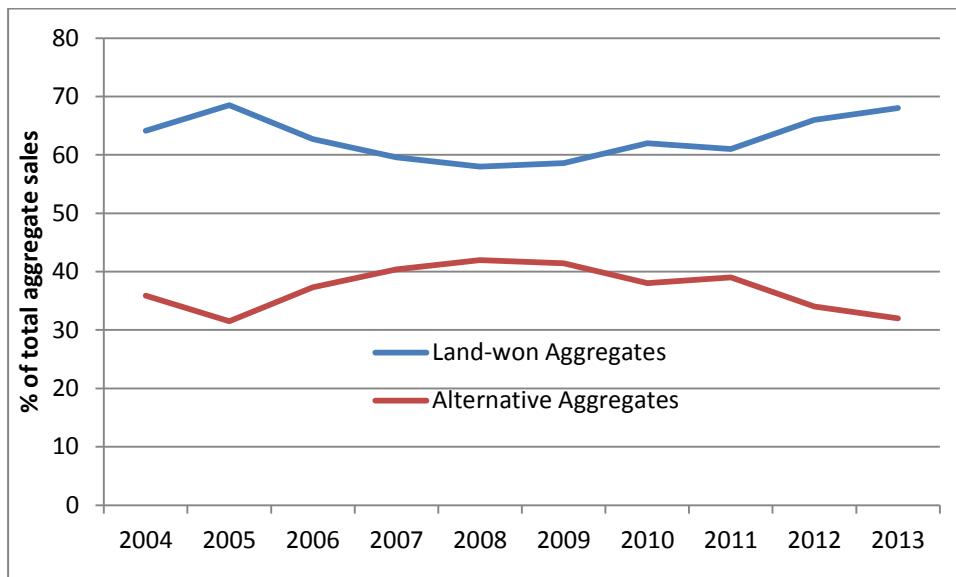


Figure 5.1: Relative sales of land-won and marine/alternative aggregates in Devon, 2004-2013

- 5.9 Figure 5.1 illustrates the relative shares of total aggregate sales for land-won and marine/alternative aggregates over the past ten years. The generally downward trend in the market share of land-won aggregates until 2008 was mirrored by the upward trend for marine/alternative aggregates (the peak in land-won aggregates in 2005 was due to a one-off increase in crushed rock sales to deliver major highway schemes in that year). However, the proportionate contribution of alternative aggregates has generally declined. It should be noted that the contribution of recycled aggregates to the total sales of alternative aggregates is based on estimated figures developed from national data as explained in Appendix B, and the reliability of these figures is therefore qualified.
- 5.10 The general trends shown in Figure 5.1 suggest a reversal of the previously increasing level of substitution of land-won aggregates by alternative aggregates, and it is unclear why this has occurred, given the continued existence of the Aggregates Levy (notwithstanding removal of exemptions from April 2014 as explained in 6.8) and the availability of adequate capacity for production of secondary and recycled aggregates. Figure 3.3, illustrating the relative share of land-won aggregate sales, suggests a gradual increase in substitution of sand and gravel by crushed rock.
- 5.11 Within Devon, there is potential for increased substitution between the different types of aggregate, including the use of crushed rock fractions instead of sand and gravel, as well as secondary and recycled aggregates replacing land-won sand, gravel and crushed rock. However, it would be

unwise to assume that full substitution of one resource by another is feasible, or always desirable, as technical requirements may constrain this. One example of the implications of substitution of aggregates is that secondary aggregates from china clay waste require an increased level of cement when used in concrete than is the case with land-won aggregates [British Geological Survey (2007)]. A further example is that, while secondary and recycled aggregates are capable of being used in road sub-base, they do not possess the resistance to polishing required for the surface layer.

- 5.12 In addition, the limited spatial occurrence of some resources, such as secondary aggregates (the major proportion of which are derived from the china clay operations near Plymouth) would result in increased transport costs (both financial and environmental) if they were to be substituted for land-won resources that are located closer to areas of demand in other parts of Devon.
- 5.13 Paragraph 3.18 highlighted that the land-won sand and gravel landbank in Devon did not extend to the 2031 end date of Devon County Council's Minerals Plan, suggesting a shortfall in supply during that period. Since around 85% of Devon's land-won sand and gravel supply is derived from the Budleigh Salterton Pebble Beds (paragraph 3.6), it is useful to consider the scope for substitution of that resource by other aggregates available within Devon.
- 5.14 Information from the minerals industry [Devon Stone Federation (2012)] highlights the particular qualities of the Pebble Beds resource:

The extracted mineral is crushed and the resulting constituents are blended in a controlled manufacturing process to provide exactly what is required to comply with the various EN standards required by markets which include concrete and concrete screeds, Hot Rolled Asphalt, Asphaltic Concrete and building sands... The pebble beds provide a consistent feed both in terms of grading and geological makeup with >95% of the extracted mineral being quartzite.

The quartzite aggregate of the pebble beds has a significantly lower water absorption than its competitors due to its uniform mineralogy, overall grading and grain shape, lack of composite grains and lack of mica, making it a much more efficient and durable material than other local aggregates, especially when used in Asphalt materials. It has proven to provide excellent skid resistance when used in surface course applications and this material will outperform most other aggregates available within the South West.

Furthermore, due to the sharp and hard nature of the quartzite mineral from the pebble beds, the grit material that is produced from the manufacturing process is the only material that Devon County Council has approved and specified for the gritting of SMA [Stone Mastic Asphalt] on Devon's road network.

- 5.15 Of the potential alternatives to this resource, the Devon Stone Federation advise that china clay secondary aggregates have a more limited grading (biased in the 2-4mm size fraction), together with a more variable mineral make-up and weathering. One outcome of these properties is the increased water demand and proportion of cement required in concrete.

- 5.16 Another alternative resource, crushed rock fines, are also considered to be gap-graded, for which rebalancing to match product grading would result in significant volumes of unusable waste. While better in terms of water absorption than china clay aggregates, this is still a significant factor for crushed rock fines.
- 5.17 The information provided by the Devon Stone Federation has been verified by Devon County Council's Materials Laboratory, which also advises that quartzite from the Pebble Beds has been trialled and approved for use in high friction surfacing. When used as a surface dressing aggregate (8mm through grade), the quartzite achieves an effective PSV of 60-64, reducing Devon's reliance on gritstone imported from elsewhere in the UK.

Pattern of Aggregate Movements

- 5.18 Information on the destinations of aggregates sold from Devon's quarries, together with the quantities of aggregates imported into the county, is available for 2009 from the AM2009 aggregates survey. Broadly speaking, these data suggest that Devon was relatively self-sufficient in aggregates in 2009 with lower levels of imports and exports than many other counties, but more recent data is unavailable to establish whether this remains the case. The next national Aggregate Minerals survey is due in 2015, which will allow a more recent perspective in the fourth iteration of the LAA.
- 5.19 Discussions with other MPAs and the minerals industry provide some further detail on cross-boundary flows of aggregates within the constraints of commercial confidentiality:
- ◆ the main destinations for the relatively small quantities of sand and gravel and crushed rock aggregates exported from Devon are Somerset (mainly the south west of the county around Taunton) and, to a lesser extent, Cornwall;
 - ◆ the main destinations for secondary aggregates from Devon are Cornwall (most likely the eastern part of the county in the light of the availability of substantial secondary aggregate resources in the St Austell area) and Somerset;
 - ◆ much of the sand and gravel imported into Devon is likely to have originated in Dorset, which has an operational quarry located close to the eastern boundary of Devon (see Figure 5.2) in an area of the latter where there no operational quarries;
 - ◆ the substantial quantity of crushed rock aggregates imported into Devon is partly due to an absence of quarries producing the highest specification aggregates, with Cornish quarries close to the boundary with Devon being the main source (see Figure 5.2), supplemented by imports from elsewhere in England and South Wales; in addition, limestone from the Mendips is transported by rail to Exeter.

Transportation of Aggregates

- 5.20 Movement of aggregates between quarries and markets within Devon is wholly by road due to the short distances involved and the general lack of

suitable rail infrastructure at quarries. However, there are examples of the use of rail and water for aggregate transport to and from the county (locations indicated in Figure 5.2):

- ◆ wharves in Plymouth are used for the shipping of limestone from Moorcroft Quarry, secondary aggregates from china clay operations and ball clay and china clay minerals and, on occasion, aggregates from Cornwall, together with inward movements of land-won aggregates;
- ◆ secondary aggregates in the form of blast furnace slag are imported through Teignmouth Docks;
- ◆ limestone from Whatley Quarry in Somerset is brought by rail to Exeter for local sale; and
- ◆ imports of crushed rock through Yelland Wharf commenced in 2013.

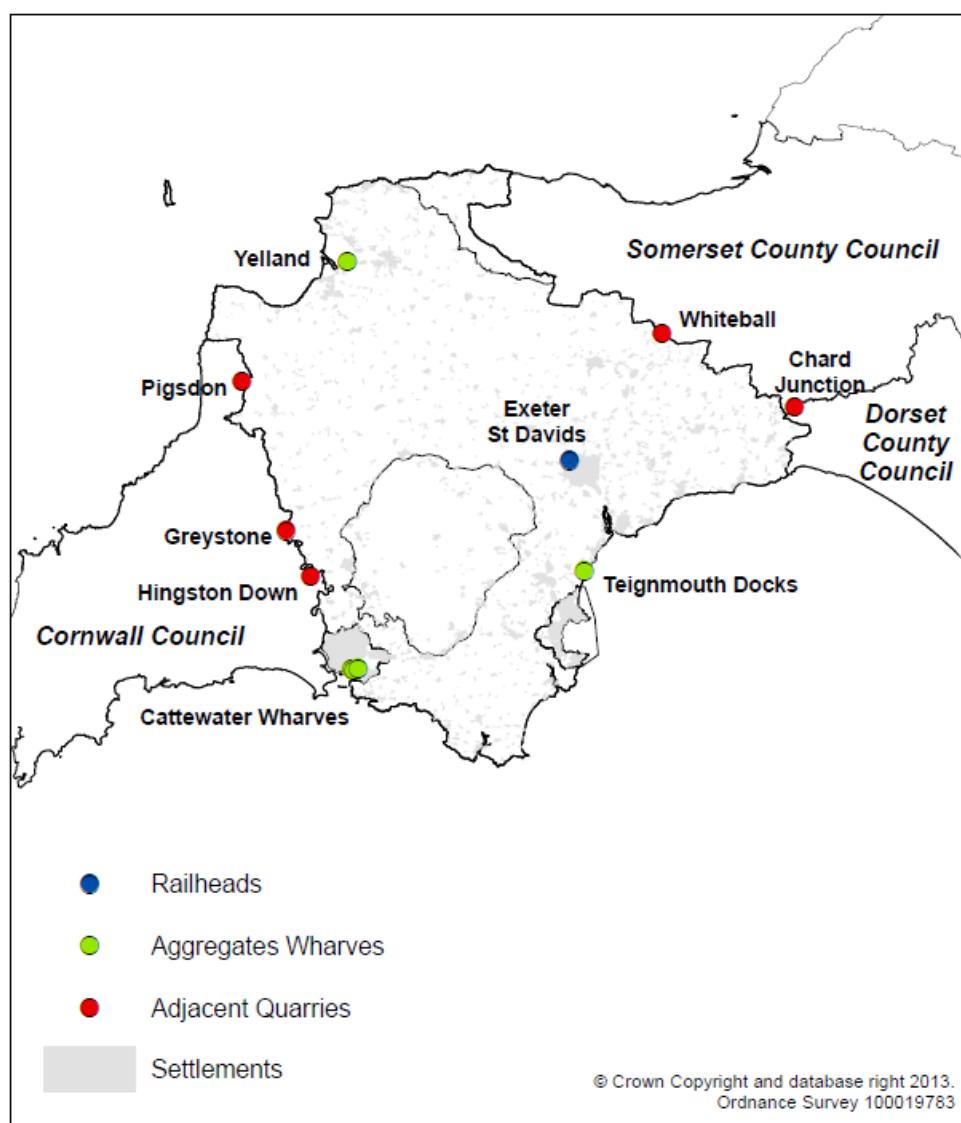


Figure 5.2: Aggregate Transportation Infrastructure in Devon and Location of Nearby Aggregate Quarries

Rail Infrastructure

- 5.21 The viability of using rail for the transportation of aggregates tends to be limited to the movement of materials in bulk on an inter-regional basis, with examples being major crushed rock quarries in Somerset and Leicestershire supplying markets in the South East of England. In Devon, the relatively small output of its quarries, the distance to major markets and presence of intervening supply areas such as the Mendips, and constraints with the county's rail infrastructure together limit the feasibility of transporting aggregates by rail.
- 5.22 Only one aggregates quarry in Devon – Meldon Quarry in Dartmoor National Park – is rail-linked, and this has supplied rail ballast for use in the south of England. The operator secured a variation to its planning permission to allow minerals from its operations elsewhere in Devon and Cornwall (including secondary aggregates) to be brought to Meldon by road for onward movement by rail. However, the quarry and railhead closed in 2011 and are currently being offered for sale.
- 5.23 Devon currently has one rail depot used for the importation of aggregates from outside the county, with Hanson transporting limestone from their Whatley Quarry in Somerset to Exeter St Davids.
- 5.24 Of the non-aggregate mineral resources that yield secondary aggregates from their waste, only the ball clay resource in the Bovey Basin has the potential for being rail-linked. The Heathfield branch line north west of Newton Abbot has been used in the past for transportation of ball clay, and is currently used for the outward movement of waste timber, and could potentially be used for the transportation of ball clay sand. However, the small quantities of these secondary aggregates that are currently produced would limit the viability of movement by rail.

6. FUTURE AGGREGATES SUPPLY

6.1 The National Planning Policy Framework requires that a LAA be “based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine, secondary and recycled sources)”. It is anticipated by the NPPF that MPAs will make provision for the land-won and other aggregates sources identified in their LAA in their minerals plan.

The Future Context

- 6.2 Future demand for aggregates as a whole will be influenced by two main factors:
- ♦ the future level of construction activity, including new development and maintenance of existing infrastructure in Devon (and, to a more limited extent, in adjoining areas served by Devon’s aggregate producers); and
 - ♦ the intensity of aggregate use in construction activity, including the extent to which aggregates are replaced by other materials such as timber, steel and glass.
- 6.3 Forecasts produced by Devon County Council indicate that the county’s population is likely to grow from 1,153,149 in 2013 to 1,334,261 in 2031, an increase of 16%. Accommodating this forecast population increase, together with associated employment and other development and infrastructure, will be achieved through development planned for by Devon’s district, unitary and national park authorities. Figure 6.1 illustrates the location and scale of the main areas of housing development identified in Devon’s Local Plans for the period to 2031.
- 6.4 The December 2013 edition of the Government’s National Infrastructure Plan [HM Treasury (2013)] identifies several projects within or close to Devon, including the Kingskerswell Bypass, new flood defences at Exeter and Plymouth, beach management at Dawlish Warren and Exmouth, the Exeter and South West Devon Waste Partnership waste proposals, and Hinkley Point C power station.
- 6.5 In addition, the National Infrastructure Plan identifies general initiatives in fields including communications, waste and energy that may have implications for Devon. The National Infrastructure Plan will be monitored as an influence on demand for aggregates within Devon; however, its value in considering future aggregate requirements in Devon is limited by its lack of detail on the scale of development.
- 6.6 The Government published in April 2014 a list of infrastructure projects due for commencement in 2014/15¹⁸, and these include the following within Devon:

¹⁸

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/305126/Infrastructure-starts-and-completions-in-2014-15.pdf

- ◆ pinchpoint road schemes at Drumbridges (A38), Manadon (A38), and Splatford Split (A38/A380); M5 Junctions 27 and 30; Tithebarn link road, Exeter; and Marjon link road, Plymouth;
- ◆ a new rail station at Newcourt, Exeter; and
- ◆ flood defence schemes at Dawlish Warren and Exmouth Beach, Exeter and Whimple.

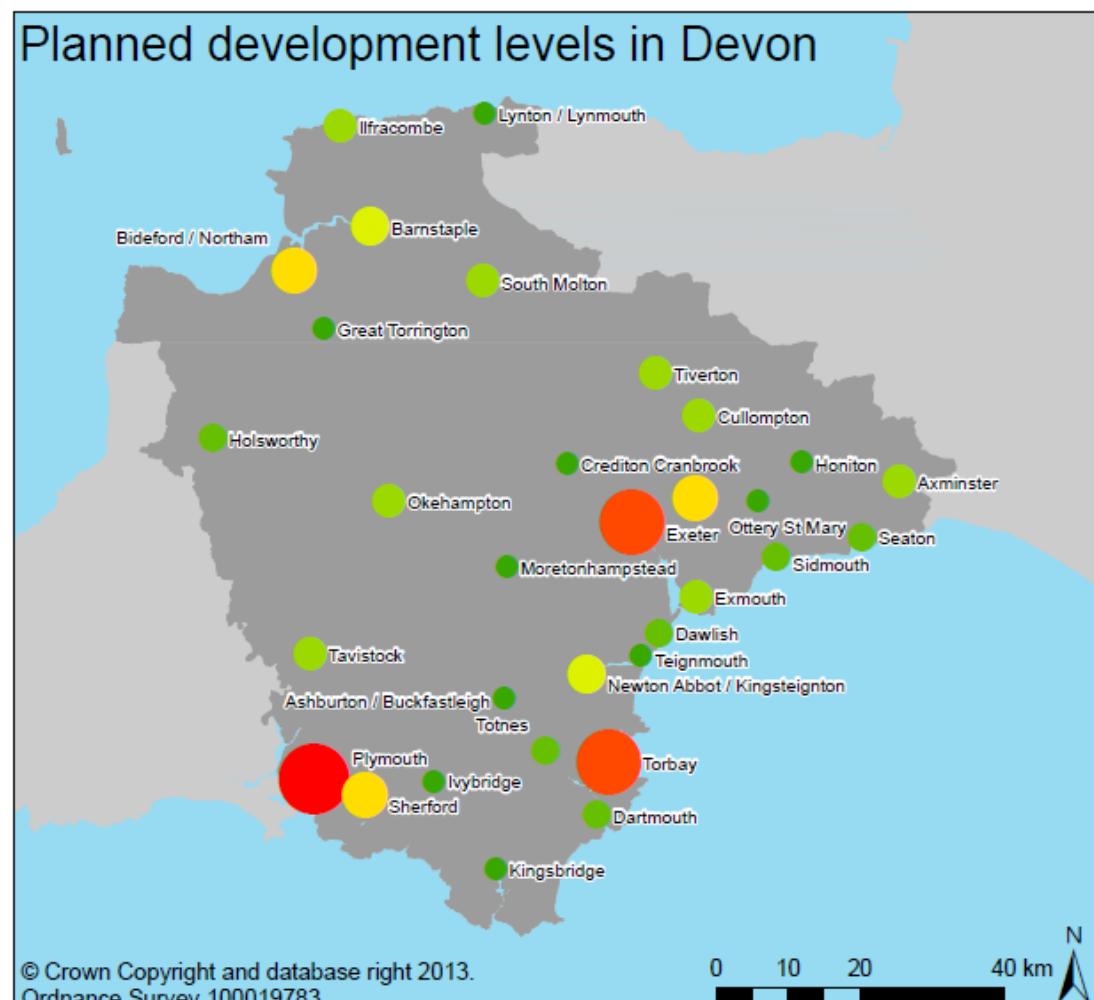


Figure 6.1: Planned housing development levels in Devon to 2031

- 6.7 In addition to overall demand for aggregates, future supply requirements in Devon will be influenced by factors affecting the market share of the different streams available (i.e. land-won crushed rock and sand and gravel, and marine and alternative aggregates). These factors include:

- ◆ the influence of national fiscal measures such as the Aggregates Levy (the subject of ongoing legal challenge) and Landfill Tax;
 - ◆ the procurement decisions of developers in specifying materials;
 - ◆ the development of quality protocols for aggregates and their influence on perceptions of alternative aggregates;
 - ◆ the costs of transporting alternative aggregates to markets more distant from their area of production; and
 - ◆ the extent to which it is technically feasible to substitute one aggregate stream for another.
- 6.8 With regard to the first of these factors, the UK Government received notification in August 2013 of the European Commission's investigation into exemptions from the Aggregates Levy. As a consequence, HM Revenue and Customs has announced¹⁹ the removal of exemptions from the Levy, with effect from 1st April 2014, for a range of secondary aggregates (including waste from ball clay and china clay extraction; shale and slate resulting from the extraction of other rock; and the spoil from the separation of industrial minerals, which will include tungsten). These secondary aggregates will therefore be liable to the Aggregates Levy until such time as the exemptions may be reintroduced.
- 6.9 The range of factors identified above indicates that it would be difficult to accurately model future demand for aggregates at the county level as a refinement of the basic ten year average, particularly as some of these factors are not easily quantifiable. Most notably, the removal of the Aggregates Levy exemptions for secondary aggregates introduces significant uncertainty into the prediction of future requirements for land-won aggregates. To accommodate these uncertainties, the responsiveness of the LAA to fiscal measures and changing trends in construction activity and aggregate use is enhanced through the use of weighted averages of the past 10 years of sales for each aggregate stream (see Appendix A of the First Local Aggregate Assessment). The scope for the maintenance and, if warranted by future demand, enhancement of this level of production is assessed below.

Land-won, Marine and Alternative Aggregates Supply

- 6.10 Preceding chapters have presented data on past sales of land-won aggregates and alternative sources, and Table 6.1 collates the weighted 10 year average sales for the different streams of aggregates supply in Devon between 2004 and 2013. The ability for these levels of supply to be maintained for the Plan period to 2031, or to meet increased demand if it were to occur, is considered below for individual aggregate streams.

¹⁹ <http://www.hmrc.gov.uk/briefs/excise-duty/brief3113.htm>

Aggregate stream	10 year weighted average sales (million tonnes)	% of total sales
Land-won Crushed Rock	2.23	50.9
Land-won Sand & Gravel	0.54	12.3
Marine	0.05	1.1
Secondary	0.45	10.3
Recycled	1.11*	25.3
Total	4.38	

Table 6.1: Weighted Annual Average Aggregate Sales 2004-2013 (* estimated)

Land-won Crushed Rock

- 6.11 As indicated in Table 3.4, all types of crushed rock resource (i.e. limestone, sandstone and igneous/metamorphic rock) have landbanks of 45 years or more, indicating that not only can recent levels of production be maintained, but significant increases in output could be accommodated if warranted by demand. However, there is limited supply of high-specification aggregates from quarries within Devon, resulting in a need to import these materials from elsewhere in the UK, and this is an issue to be addressed by Devon County Council in its Minerals Plan.

Land-won Sand and Gravel

- 6.12 Table 3.3 identifies the quantity of permitted reserves of land-won sand and gravel at the end of 2013 as 8.13 million tonnes which, using the weighted ten year average sales of 0.54 million tonnes in Table 6.1, provides a landbank of 15.1 years. This landbank does not extend to the 2031 horizon of Devon County Council's Minerals Plan, indicating a potential need for this Plan to provide for further sand and gravel resources if the minimum landbank of seven years is to be maintained to 2031.
- 6.13 While sand and gravel requirements will be subject to monitoring through future iterations of the LAA, projecting the current weighted ten year average of 0.54 million tonnes forward over the Minerals Plan period from 2014 to 2031 (18 years) gives a potential requirement of 9.72 million tonnes which, after accounting for the existing permitted reserves (8.13 million tonnes), leaves a potential shortfall of 1.59 million tonnes.
- 6.14 While any future reduction in sales of sand and gravel will have the effect of lowering the rolling ten year average and therefore extending the length of the landbank, any future increase in demand for land-won sand and gravel would conversely have the effect of shortening the landbank further.
- 6.15 Two further issues concerning future supply of land-won sand and gravel identified in Chapter 3 that will require monitoring by Devon County Council are:
- ◆ the renewal or otherwise of the planning permissions identified in Table 3.5 that are due to expire in the early part of the Devon Minerals Plan period, together with the potential for permissions to lapse in the event of non-submission of schemes required under Schedule 14 of the Environment Act 1995; and

- ♦ the relationship between the distribution of sand and gravel reserves and the approach to be pursued in Devon County Council's Minerals Plan to the spatial pattern of aggregates supply.

Marine Aggregates

- 6.16 Comparison of actual and licensed rates of dredging within the Bristol Channel indicates that there is scope for a significant increase in the volume of marine sand and gravel to be achieved. Provided that wharves in North Devon remain available for the landing of dredged materials, the maintenance of the recent level of supply or a significantly increased level of up to double the rate identified in Table 6.1, appears to be achievable.

Secondary Aggregates

- 6.17 The continued or increased supply of secondary aggregates through the processing of waste arising from Devon's resources of china clay, ball clay and slate is dependent on the continued availability of the source materials. While the china clay operations at Lee Moor that supply the bulk of Devon's secondary aggregates have contracted in recent years, they remain a source of 'as dug' waste that is being supplemented through the excavation of previously-tipped waste. Working of ball clay in the Bovey Basin remains buoyant, while the small slate quarry at Mill Hill has extensive waste tips that can be re-worked to supplement waste from building stone processing.

Recycled Aggregates

- 6.18 As indicated in paragraph 4.20, the level of supply of recycled aggregates is influenced by the volume of arisings of CDEW and the proportion of this waste that is recycled for aggregate use. A potential constraint on increased production is the availability of adequate capacity at recycling facilities located in close proximity to sources of CDEW and markets for the recycled aggregates derived from that waste.
- 6.19 The limited information available suggests that Devon's fixed CDEW recycling facilities have adequate capacity for current and potentially greater levels of recycled aggregates production. Figure 4.4 indicates that the distribution of these sites reflects the location of the major population centres in Devon that will be the sources of CDEW and markets for the aggregates produced.

Transportation Infrastructure

- 6.20 Evidence in Chapter 6 suggests that wharves in Plymouth have adequate spare capacity to cater for any increase that may occur in the use of the port for inward or outward movement of aggregates by sea, particularly with the declining trade in china clay. The availability of these wharves, together with others in Devon that handle or could handle aggregates, should be safeguarded through relevant MPA's Minerals/Local Plans. Similarly, the railheads currently or recently used for the limited volumes of aggregates transported to and from Devon by rail should be safeguarded to maintain their potential.

Implications for Individual Mineral Planning Authorities

- 6.21 As indicated in paragraph 1.3, each of Devon's MPAs is providing its own minerals planning policy, either as part of its Local Plan or through a 'stand alone' Minerals Plan. Since the distribution of mineral resources and supporting infrastructure across Devon is uneven, not all of the requirements for future provision arising from this LAA are relevant to each of the five MPAs. Table 6.2 therefore provides a summary of the issues identified above and identifies the MPA(s) to which each is relevant.

Issue (■ – issue is of relevance to MPA)	Dartmoor	Devon CC	Exmoor	Plymouth	Torbay
Safeguarding of crushed rock reserves and processing capacity	■	■		■	
Provision for further supply of high-specification crushed rock aggregates		■			
Safeguarding of sand & gravel reserves and provision for further resources		■			
Safeguarding of wharf capacity for marine aggregates		■			
Maintaining availability of resources and processing capacity for secondary aggregates		■			
Maintaining processing capacity for recycled aggregates	■	■		■	■
Safeguarding of infrastructure for movement of aggregates by rail or sea	■	■		■	

Table 6.2: Implications of the Local Aggregate Assessment for Devon's MPAs

- 6.22 The LAA has identified that Exmoor National Park does not currently produce any form of aggregate, rather it is reliant on imports from the surrounding MPA areas. Given National Park purposes and the geology of the area, and the lack of scope for exceptional circumstances to apply, it is envisaged that no significant level of aggregate production will occur in Exmoor in the foreseeable future. Similarly, Torbay does not produce land-won aggregates and relies on materials from elsewhere, but it does accommodate an operation producing recycled aggregates.
- 6.23 Plymouth and Dartmoor National Park each have one operational crushed rock quarry, with a further quarry within Dartmoor (Meldon) having closed. Each of these authorities therefore contributes to Devon's crushed rock production and landbank, with both of the operational quarries also producing recycled aggregates. These two authorities are required to make provision for the safeguarding of their reserves of crushed rock aggregates, together with ensuring the availability of infrastructure for the sustainable transportation of aggregates – the Cattewater wharves in the case of Plymouth, and the recently-closed Meldon rail line within Dartmoor.
- 6.24 Devon County Council shares responsibility for crushed rock production, recycled aggregates and rail and sea transportation with the other MPAs. However, it has the only capacity in the county for production of land-won sand and gravel, high-specification aggregates and secondary aggregates,

and provides the only wharfage in Devon used for the landing of marine aggregates.

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APPENDIX A: AGGREGATE FACILITIES IN DEVON

- A.1 The table below provides details of the land-won aggregate quarries, processing facilities for secondary and recycled aggregates and facilities for transportation of aggregates within Devon that were operational during 2012, together with inactive aggregate quarries that retain permitted reserves²⁰.

Land-won Aggregate Quarries – Operational in 2013				
MPA	Key ²¹	Quarry	Operator	Mineral
DCC	1	Bableigh Wood	D E & R Chance	Sandstone
DCC	2	Beam	Torrington Stone	Sandstone
DCC	3	Bishop's Court	Aggregate Industries	Sand
DCC	4	Blackhill ²²	Aggregate Industries	Sand & Gravel
DCC	5	Bray Valley	Hanson	Sandstone
DCC	6	Hearson	G Horrell	Sandstone
DCC	7	Hillhead ²³	Aggregate Industries	Sand & Gravel
DCC	8	Knowle	Faheys Concrete	Sandstone
DNPA	9	Linhay Hill	E & J W Glendinning	Limestone
PCC	10	Moorcroft	Aggregate Industries	Limestone
DCC	11	Newbridge	Newbridge Stone	Sandstone
DCC	12	Rockbeare Hill	Aggregate Industries	Sand & Gravel
DCC	13	Stoneycombe	Aggregate Industries	Limestone
DCC	14	Town Farm	Hanson	Sand & Gravel
DCC	15	Uplyme ¹⁸	E & J W Glendinning	Sand & Gravel
DCC	16	Venn Ottery	Aggregate Industries	Sand & Gravel
DCC	17	Vyse	Braunton Aggregates	Sandstone
DCC	18	Westleigh	Aggregate Industries	Limestone
DCC	19	Whitecleaves	Gilpin Demolition	Dolerite
DCC	20	Zig Zag	Harleyford Aggregates	Sand & Gravel

Land-won Aggregate Quarries – Inactive in 2013			
MPA	Quarry	Operator	Mineral
DCC	Babcombe Copse	Harleyford Aggregates	Sand & Gravel
DCC	Beer	Hanson	Chalk
DCC	Haldon	RF Aggregates (SW)	Sand & Gravel
DNPA	Meldon	Aggregate Industries	Dolerite/Hornfels
DCC	New England	None	Dolerite
DCC	Plaistow	Hanson	Sandstone
DCC	Trusham	Hanson	Dolerite
DCC	Tuckingmill	None	Sandstone
DCC	Venn	Aggregate Industries	Sandstone

²⁰ Dormant quarries that would require the submission of a new scheme of working conditions prior to their reopening are omitted from the list, as are quarries with no remaining reserves that are considered to have closed permanently.

²¹ The key relates to Figure 2.1.

²² Blackhill Quarry processes materials imported from Venn Ottery and Rockbeare Hill Quarries

²³ Aggregate working in 2013 limited to sale of materials from stockpiles

Secondary Aggregate Processing Facilities

MPA	Key ²⁴	Site	Operator	Resource
DCC	A	Headon	Tarmac	China clay waste
DCC	B	Lee Moor	Aggregate Industries	China clay waste
DCC	C	Mill Hill Quarry	Mill Hill Quarries Ltd	Slate waste
DCC	D	Preston Manor	Sibelco	Ball clay sand

Recycled Aggregate Processing Facilities

MPA	Key	Site	Operator
DCC	1	Bableigh Wood	D E & R Chance
DCC	2	Challonsleigh	Dorton Group
DCC	3	Coventry Farm	ABC Siddalls Skip Hire
DCC	4	Dittisham	D B Skips
DCC	5	Fosterville	Fosterville Ltd
DCC	6	Hayedown	The Sparling Group
DCC	7	Hill Barton	A E Stuart & Sons
DCC	8	Holmacott	John Coles Contractors
DCC	9	Johnsland	Okehampton & Crediton Skip Hire
DNPA	10	Linhay Hill Quarry	E & J W Glendinning Ltd
DCC	11	Little Stowford	Greenaways
PCC	12	Moorcroft Quarry	Aggregate Industries
DNPA	13	Pitts Cleave Quarry	R P & S Heywood Haulage Ltd
DCC	14	Stoneycombe Quarry	Aggregate Industries
DCC	15	Strashleigh Hams	Jeremy Bishop Haulage Ltd
DCC	16	Trood Lane	B T Jenkins Ltd
DCC	17	Westleigh Quarry	Aggregate Industries
TC	18	Yalberton Tor Quarry	R F Aggregates
DCC	19	Yelland	Notts Contractors Ltd

Aggregate Transportation Facilities

MPA	Site	Mineral Operator	Facility
DCC	Appledore Wharf	Hanson Marine	Wharf
DCC	Exeter St Davids	Hanson	Rail siding
DCC	Middle Dock, Appledore	Hanson Marine	Wharf
PCC	Pomphlett Jetty, Plymouth	Aggregate Industries	Wharf
DCC	Teignmouth Dock	Hanson	Wharf
DCC	Yelland Wharf	Notts Contractors	Wharf

DCC Devon County Council

DNPA Dartmoor National Park Authority

PCC Plymouth City Council

TC Torbay Council

²⁴ The keys for secondary and recycled aggregate sites relate to Figure 4.4

APPENDIX B: RECYCLED AGGREGATES DATA

- B.1 The approach to the calculation of sales figures for recycled aggregates in previous iterations of the Devon LAA was explained in paragraphs A.7 to A.14 of the 1st LAA. This method recognised the lack of robust data for recycled aggregates, and used assumptions on Devon's share of national and regional production to develop local figures.
- B.2 However, the lack of available data on recycled aggregates at a national level since 2010 has resulted in the 1st and 2nd iterations of the Devon LAA assuming a continued level of recycled aggregates production of 1.12 million tonnes up to 2012. This is considered to be a less than robust approach, and an alternative methodology based on a local survey has therefore been undertaken for 2013.
- B.3 Survey forms were sent to the operators of the 19 facilities in Devon undertaking the recycling of construction, demolition and excavation waste for recycled aggregates. The form included questions on the actual tonnage of recycled aggregates sold from the site in 2013, and the capacity of the site (i.e. the maximum annual throughput of recycled aggregates).
- B.4 Completed forms were received from 10 sites, giving the following results:
- Total recycled aggregates sold: 163,131 tonnes
- Total capacity of sites: 545,795 tones
- Aggregates sold as % of total capacity: 29.9%
- B.5 The capacity of all recycling sites in Devon, including those not returning a form, is 1,987,500 tonnes. By applying a proportion of 30% (i.e. a rounded 29.9% derived from the survey results), it can be estimated that Devon's fixed recycling sites generated 596,250 tonnes of recycled aggregates in 2013.
- B.6 As noted in paragraph A.14 of the 1st LAA, fixed recycling sites only account for some recycled aggregates, with the remainder being produced at temporary sites (particularly at construction sites) that were not covered by the County Council's survey. It was estimated in the 1st LAA that fixed recycling sites account for two thirds of recycled aggregates, with the other third from temporary sites.
- B.7 To take account of the contribution of temporary sites, the figure of 596,250 tonnes was multiplied by a factor of 1.5, resulting in a total estimated figure of 894,375 tonnes of recycled aggregates from all sites in Devon.
- B.8 As this 3rd LAA is adopting a different methodology to that used in the previous two iterations, a smoothing function has been applied to the figures for the two years (2011 and 2012) for which continuation of 2010's data was assumed. The figures for the intervening two years have been adjusted by applying a steady rate of change from 2010 to 2013, resulting in the figures provided in Table 4.2.