The Third Local Aggregate Assessment for Kent

November 2015

Kent County Council
kent.gov.uk

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i Abbreviations

AM	Aggregate Monitoring
AMR	Annual Monitoring Report
AWP	Aggregate Working Party
BGS	British Geological Survey
CD&E	Construction, Demolition and Excavation originated waste materials
DCLG	Department for Communities and Local Government
EA	Environment Agency
EiP	Examination in Public
FBA	Furnace Bottom Ash
IBA	Incinerator Bottom Ash
LAA	Local Aggregate Assessment
KCC	Kent County Council
LEPs	Local Enterprise Partnerships
MASS	Managed Aggregate Supply System
MMO	Marine Management Organisation
MPS	Minerals Policy Statement
MPA	Mineral Planning Authority
mt	Million Tonnes
mtpa	Million Tonnes Per Annum
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
tpa	Tonnes Per Annum
RSS	Regional Spatial Strategy
SEA	Strategic Environmental Assessment
SEEAWP	South East England Aggregates Working Party

i Abbreviations

1 Executive Summary

1.0.1 In compliance with the National Planning Policy Framework (NPPF) Kent County Council (KCC) has produced a Local Aggregate Assessment (LAA) for 2015 using data from the latest Aggregate Monitoring (AM) survey for 2014 in conjunction with previous AMs, and is accurate up until the end of 2014 in terms of landbanks. The LAA has analysed relevant up-to-date data on recycled (where supplied by the industry), secondary and landwon aggregate sales, permitted reserves and potential new resources together with importation infrastructure capacity. This document provides an understanding of how the area will maintain a steady and sustainable supply of construction aggregates to meet local demand. It is a technical document that will explicitly inform policy for aggregates supply, which is a role of the anticipated and emerging Kent Minerals and Waste Local Plan 2013-30. The public hearing for this Plan's Independent Examination was held in April/May 2015. The findings in this LAA do not show a marked change in direction of aggregate supply behaviour and the Plan's policy approach to ensuring a steady and sustainable provision of aggregates to the market does not require amendment.

1.0.2 In Kent the three main landwon minerals extracted for aggregate use are:

- Soft Sands
- Sharp Sands and Gravel
- Crushed Rock

1.0.3 The current permitted reserves for these materials are as follows:

- On the information available at the time of writing (November 2015) the soft sands of the County have some 8.04 mt of permitted reserves based on the AM returns for 2014, which is a also a yearly revision by the industry on their reserve base and can be revised irrespective of recent sales performance, this can be due to new site survey data and varying geological characteristics that come to light. A simple 7 year landbank calculation based on the 10 year average sales of 0.601 mtpa equates to a quantity of 4.20 mt. There are significant reserves in the County at this time. The degree of interchangeability between permitted soft (building or mortar) sands and industrial application sands (often referred to as silica sand) has been addressed with the known operators who have confirmed that the reserve data properly reflects the degree of soft (building) sands available as permitted reserves in Kent.

- With regard to the County's sharp sands and gravels the current permitted reserves are some 2.6mt (as of the end of 2014 when the most recent AM data was available). Based on the 10 year average sales of 0.70mtpa a 7 year landbank equates to a quantity of 4.9mt. To be a rolling or maintained NPPF compliant landbank this quantity has to be maintained in anyone one year. It has been determined that the permitted reserves do not provide for such a

provision but also would be exhausted by continued extraction, well before the end of the Plan period in 2030. This includes the permitted but yet to be worked reserves.

- Hard rock (Ragstone) permitted reserves in the County are some 48+mt in total. Unlike the sands and gravels, government guidance seeks to ensure that a 10 rather than a 7 year landbank is maintained. Based on the 10 year average sales of 0.78 mtpa (the actual figure is subject to confidentiality due to the limited number of operators in the county) there is a requirement to maintain 7.8 mt of permitted reserves year to year throughout the Pan period. This will be possible and secures supply to the market past 2030.

1.0.4 If the currently permitted sand and gravel reserves are considered with the maximum potential additional resources identified by the Mineral Site Plan Preferred Options Consultation May 2012, as deliverable resources early in the Plan period, the following resource base scenarios per the mineral types could be anticipated:

- Soft sands reserves would total 31.14 mt, by the end of the Plan period the reserves remaining would be 15.26 mt, significantly above the maintained 7 year required landbank of 4.41 mt.

- Sharp sands and gravel reserves would total 11.08 mt, the maintained 7 year requires a landbank of 5.46 mt in any one year of the Plan's time span, by the end of the Plan there would be a 7.64 mt shortfall.

1.0.5 Combining the sands and gravel into one landbank would not accord with the requirements of the NPPF. The Plan seek to maintain the sharp sands and gravels maintained landbank over the Plan period (20130) plus 7 years. Given that the resource is not present in Kent in quantities that would support this approach. Instead the Plan will have increasing reliance on secondary, recycled and marine (and landwon from other areas) imports to provide the necessary materials to allow Kent's construction industry to function.

1.0.6 Having reached this conclusion the County Council has analysed both the capacity of alternative aggregate supply from the recycling and secondary aggregate sector operating in the County and the overall importation capacity of the area's wharves and railheads. Moreover, here is indication that sources of aggregate supply outside Kent from the wider UK (and further abroad) would be reliable in terms of future availability. Taking the two alternative sources of supply it has been found that:

- Secondary and recycled aggregate productive capacity in the County is in the order of 1.2 mtpa.

- Wharf capacity in the County overall is an estimated 8 mtpa and railhead estimated capacity is in excess of 2.7 mtpa.

1.0.7 When considered together these alternatives to landwon sharp sands and gravel could provide over 11 mtpa of aggregate supply, more than adequate to meet Kent's needs at this time (currently approximately 0.78 mtpa based on the last 10 years sales averages) and continue to provide those exports to other areas outside Kent that are currently part of the existing overall import export balance. Although there is a current underutilisation of the capacity across Kent's wharves and railheads, the capacity remains fragile. The loss of one or more importation sites to other development could make a significant reduction to the current surplus of capacity. This apparent surplus now will become increasingly important through time. Therefore the ongoing safeguarding of the importation infrastructure will be imperative in securing Kent's needs into the future.

1.0.8 The LAAs for the South East area county councils and unitary planning authorities are required to be ratified by the SEEAWP before the end of 2015. Kent County Council's LAA has been shared in draft form and has been agreed by the Aggregate Working Party (AWP) subject to ensuring that importation infrastructure is appropriately safeguarded, as future supply of certain important aggregate types in Kent will increasingly come from alternatives to local extraction (see Appendix E. SEEAWP letter of approval of Kent's draft third LAA). Government will expect AWPs to assess all respective LAAs in their area to determine if overall demand is being met sub-regionally that accords with the national guidelines that sets out the sub-regional requirements. This in turn will enable the National Aggregate Co-ordinating Group (who monitor annual reports produced by each AWP, with particular emphasis on the landbank position) to then report back to Government for national monitoring on the level of aggregate supply being achieved nationally.

2 Introduction

2.0.1 This is the third LAA that Kent County Council has produced. It is a formal requirement of the NPPF to produce such a document each year to gain an understanding of how aggregate supply and needs may be changing. In essence it is a technical monitoring document to inform mineral planning policy. Aggregate forming materials are predominantly naturally occurring geological deposits, taken from the earth's crust. Unconsolidated sands and gravels come from deposits considered as 'superficial' in that they rest on the surface overlaying the more massive geological makeup below. These superficial deposits on the land surface and the sea bed are a significant source of aggregates supply. In addition, the main geological units that form an area's geological crustal history are important, these materials are generally referred to as hard rock resources.

2.0.2 In Kent these main geological units supply building sands (largely unconsolidated sands of the Folkestone Formation) and hard rock (limestone of the Kentish Ragstone, Hythe Formation) the latter can be crushed to form sized aggregates. Also, aggregates can be formed by re-using and recycling materials, and as a new use for a material derived from another unrelated (to quarrying and construction) activity. Furnace bottom ash, for example, from the power generation sector can be used as an aggregate, often called a secondary aggregate that is, in effect, a substitution for primary or naturally derived aggregates. The value to society of all aggregate materials is in their use as a construction material for such products as structural concrete for major works, asphalts for road building and maintenance and bulk fill for engineering projects and land stabilisation (e.g beach replenishment).

2.0.3 The main purpose of this third Kent LAA is to further the understanding of both the current local demand for and supply of aggregates in the area, to help inform decision making for planning applications and objectively assessed mineral plan policy formulation. This changes with time and reviewed on a yearly basis. It should also help inform the minerals industry in their investment decision making and the wider community on future supply of aggregates. This technical document is evidence to support planning policy formulation, it is considered as a technical monitoring document and contains the following elements:

- a forecast of the demand for aggregates based on both the rolling average of 10-years sales data and other relevant local information;
- an analysis of all aggregate supply options, as indicated by existing landbanks, mineral plan allocations and capacity data e.g. marine licences for marine aggregate extraction, recycled and secondary aggregates and the potential

throughputs from wharves and railheads. The analysis of these elements should be informed by planning information held by the authority, the aggregate industry and other bodies such as local enterprise partnerships; and

- an assessment of the balance between demand and supply and the economic and environmental opportunities and constraints that might influence the situation in Kent. In conclusion it considers shortage and/or surplus in supply of the varying aggregate types, and where there is a defined shortage how this should be addressed.

3 Policy Context

3.1 Localism Act 2011

3.1.1 Nationally there are guidelines that apportion to the regional areas the amounts of aggregates of the various types that are required to meet England's overall need for the period 2005-20 (as set out in Table 1). This has not changed since the second Kent LAA was produced. The sub-regional apportionments were formulated primarily for use by the now abolished regional assemblies taking into account advice from the respective MPAs and mineral operators. The guidance is still in place, and the National Aggregate Co-ordinating Group exists to monitor the overall provision of aggregates in England, and to provide timely advice to Government and individual AWPs examining any significant difference between individual Aggregate Working Party (AWP) reports and the relevant National and Sub-National Guideline figure. This national body exists in order to understand the reason for any such difference, and whether it raises issues of concern about ensuring a steady and adequate provision of aggregates in England. The National Aggregate Co-ordinating Group shares its findings with both the individual AWPs and Government as necessary. The national body also has the role of providing guidance to Government on future National and Sub-National requirements for aggregates supply. This will include whether, and when, it needs to review National and Sub-National guidelines for aggregate provision in England.

3.1.2 MPA's produce both AMR and LAA documents, which are informative to the AWPs who in turn inform the National Aggregate Co-ordinating Group and ultimately the Government.

Table 1 National and Regional Guidelines for Aggregates Provision in England 2005-2020 (mt) June 2009

New Regions	Guidelines for Landwon Production		Assumptions (these resources are less certain in terms of their potential overall quantum over the guideline time span than landwon resources)		
	Land-won Sand & Gravel	Land-won Crushed Rock	Marine Sand & Gravel	Alternative Materials	Net Imports to England
South East England	195	25	121	130	31
London	18	0	72	95	12
East of England	236	8	14	117	7

New Regions	Guidelines for Landwon Production		Assumptions (these resources are less certain in terms of their potential overall quantum over the guideline time span than landwon resources)		
	Land-won Sand & Gravel	Land-won Crushed Rock	Marine Sand & Gravel	Alternative Materials	Net Imports to England
East Midlands	174	500	0	110	0
West Midlands	165	82	0	100	23
South West	85	412	12	142	5
North West	52	154	15	117	55
Yorkshire & the Humber	78	212	5	133	3
North East	24	99	20	50	0
England	**1028**	**1492**	**259**	**993**	**136**

3.2 Local Aggregate Assessment Requirement of Mineral Planning Authorities

3.2.1 The NPPF came into force in March 2012 replacing most of the previous planning policy statements and guidance documents that had been in force, e.g. Planning Policy Statement 1: Planning and Minerals (13th November 2006). To address overall mineral supply, as opposed to that that meets a defined local need, the NPPF states that MPAs should plan for a steady and adequate supply of aggregates by (amongst other matters) taking account of published National and Sub National Guidelines on future provision which should be used as a guideline when planning for the future demand for and supply of aggregates.[1] The NPPF also states that the MPA, alone or jointly, should prepare an annual LAA based on averaged 10 years past sales data and "other relevant local information", assessing all the supply options (including marine dredged, secondary and recycled sources). The online Governmental Planning Practice Guidance of March (PPG) 2014 [2] essentially reinforces the requirements of an LAA as set out in the NPPF. Paragraph 062 states that a Local Aggregate Assessment should contain.

1 National Planning Policy Framework March 2012, Para. 145, page 34.
2 http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/planning-for-aggregate-minerals/local-aggregate-assessments/

3.3 Managed Aggregate Supply System

3.3.1 The PPG published March 2014, (part 7 guidance) details the Managed Aggregate Supply System (MASS) process and how it should be applied to the process of determining a steady and sustainable source of aggregates.[3].

3.3.2 MASS as a systematic approach is not a new approach to aggregate provision, as it has been in existence for some 35 years. The underlying methodology is to ensure sufficient materials can be identified and brought to the market to meet identified local and national need through the planning system, such that the extractive industry has confidence that investment plans are realistic while the environmental concerns often directly associated with aggregate mineral exploitation are mitigated or otherwise minimised to an acceptable level. The current MASS retains this core set of principles while decentralising more power to the Mineral Planning Authorities (MPA) in accordance with a more localist approach to planning as required by the Localisim Act 2011.

3.3.3 The key element of the reformed MASS system is the LAA, where each MPA is expected to prepare an assessment of the demand for and supply of aggregates, addressing:

- a forecast of the demand for aggregates based on the average of 10 years of past sales data and any other relevant local information on demand, this may include elements from the National Infrastructure Plan that may be pertinent in the MPA area

- an analysis of all supply options to meet the demand, as indicated by the permitted and remaining landbank of reserves, any mineral plan allocations that may be reasonably expected to come forward and contribute to supply and capacity data for importation through wharves and railheads and the marine licences for marine aggregate extraction. This analysis should be informed by planning information, the industry and other bodies such as Local Enterprise Partnerships (LEPs)

- an assessment of the balance between demand and supply, and the economic and environmental opportunities and constraints that might influence the situation in the relevant MPA area. It should conclude if there is a shortage or surplus of supply to meet the anticipated demand, and if there is a deficit, how is this to be addressed

3.3.4 The aggregate material supply options to be assessed include:

- recycled aggregates (including those from construction, demolition and excavation wastes)

3 Online at: http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/planning-for-aggregate-minerals/the-managed-aggregate-supply-system/

- secondary aggregates (industrial wastes such as glass, ash, spent railway ballast etc, and mineral extraction by-products such as china clay and colliery spoil)
- marine sources from licensed dredging areas within territorial waters (the Marine Management Organisation (MMO) will be producing marine plans for the future licensing provisions)
- imports and exports balance via wharves and railheads
- landwon supply of sand and gravel and crushed rock from within the MPA's areas of economic geology

3.3.5 A LAA must consider other relevant local information in addition to the arithmetic approach of the 10 year rolling average sales based supply when looking ahead at future demand. This could include levels of planned house building in their areas and other planned construction. MPAs should also investigate average sales over the last three years to identify any recent new trends that would indicate increased supply would be appropriate. Unlike the previous Kent LAAs, landbank calculation assessments will be made for the distinctly different aggregate types in Kent, given that combining soft sands of the Folkestone Formation with the sharp or flint superficial sand and gravel deposits would not accord with either the NPPF or the online guidance (see paragraph 066 of the PPG). The hard rock assessments were hitherto and will continue to be assessed as a separate aggregate type.

3.4 South East Aggregate Working Party

3.4.1 The MASS system is intended to work in tandem with the Aggregate Working Party (AWP) system. Each draft LAA is considered by the respective AWP secretariat for technical assessment so that it is 'fit-for-purpose' and comprehensive in terms of a robust evidence base. Thus fulfilling the duty placed on MPAs to co-operate on strategic aggregate minerals planning. AWPs are composed of representatives of the component sub-regional MPA, aggregate industrial representation and the MMO where necessary. In the South East of England the AWP is the South East England Aggregate Working Party (SEEAWP).

3.4.2 It is expected by Government that AWPs will assess all the respective LAAs in their area to determine if *overall* demand is being met sub-regionally (in accordance with the national guidelines that set out the requirements for the sub-regions) to enable the National Aggregate Co-ordinating Group (who monitor annual reports produced by each AWP, with particular scrutiny of the landbank position) to report back to Government for national monitoring of the necessary level of aggregate supply. This is an additional responsibility of the AWPs to the conducting of annual aggregate monitoring surveys that provide the base data for MPAs to produce their LAA in the first instance. This process ensures local data is used to inform the sub-regional and ultimately national supply needs in a transparent manner as the data flows up the monitoring hierarchy.

3.4.3 Appendix E. Includes the letter ratifying the third Kent LAA dated 20th November 2015 signed by Mr Tony Cook the SEEAWP Chairman.

4 Aggregate Sources of Supply in Kent

4.1 Aggregate Sources of Supply in Kent

4.1.1 Kent has a varied geology with several economically important naturally occurring aggregate forming mineral deposits. The most recent of which is the post glacial (Pleistocene epoch some 10,000 years ago) outwash river valley and terraced sand and gravels and storm beach sands and gravels. The extensive soft sand ancient beach deposit (Folkestone Beds) is somewhat older, being part of the Lower Greensand Group of the Lower Cretaceous epoch (some 100-140 million years old). Hard rock is also present in Kent, in the form of a significant thickness of a complex estuarine limestone formation. That can yield important building materials and when crushed to form an aggregate (Kentish Ragstone). This material is also part of the Lower Greensand Group, forming part of what is called the Hythe Formation which was laid down prior to the Folkestone Formation, though still being within what is called the Lower Cretaceous epoch.

4.1.2 Importation into Kent is extensive, with significant capacity in wharfage complimented by some rail head facilities. The requirements of the construction world are complex and although Kent has important economic geology, there is still a need for materials that are of a certain specification and quantity which the market requires and cannot be entirely met from local land-won resources (e.g. crushed granite for railway ballast). Heightened environmental awareness and policy, climate change legislation and virgin aggregate taxation have led to an increasing contribution to the overall aggregate supply from recycled and secondary sources. Kent is no exception to this trend and the sector is an important contributor. In line with the requirements of the LAA process and the MASS guidance, Kent's sources of aggregate supply are to be assessed based on the following supply options.

4.2 Recycled and Secondary Aggregates

4.2.1 Kent has undertaken a study of the specific capacity and arisings of the activities of the recycling and secondary aggregate sector in the county, this produced information for the first Kent LAA (ratified in December 2012 and not revised in 2013). For the second LAA (ratified in February 2015 based on 2014 data) a programme of site visits (including permanent, semi-permanent and temporary sites) was undertaken during February 2012 to March 2013 covering the whole of Kent. The aim of this survey was to establish the overall capacity in the sector. The survey site visits examined plant capacity, sales data and the Environment Agency licence provisions. These formed the basis for the estimate of maximum production capacity. Table 29 in Appendix D details the findings of the survey. This should be viewed alongside the findings of the January 2012 study undertaken by consultants Jacobs to assess waste arisings and needs across all of Kent's waste streams[(4)]. For construction, demolition and excavation (CD&E) waste the recorded overall permitted

4 Waste Management Statistics Basis for Kent County Council Minerals and waste Development Framework, Addendum to the Needs Assessment Modelling Technical Report, Needs Assessment 2011 Update, Para 3.6 page 17. Evidence base ref. KCC/MWLP/CS/033

capacity to manage this material was and is expected to remain (in that no new significant planning permissions have been permitted) some1.9 mtpa (both temporary and permanent capacity). This will include material that arises in this sector but is incapable of being processed to form recycled aggregate materials. Soils and excess excavation rock spoil from the chalk would be examples of such materials. This being the case the overall recorded quantity of available materials from this waste sector is greater than that which can be processed to form recycled and secondary aggregates.

4.2.2 The vast majority of the sites surveyed were processing materials from the CD&E waste stream and producing recycled aggregates. Of the secondary aggregate production activity in Kent this has significantly reduced with the closure of the Thamesteel steel manufacturing plant at Sheerness in 2012. The furnace bottom ash (FBA) produced a marketable aggregate. The only other current source of material is bottom ash (IBA) from the municipal waste management plant (Kent Enviropower) at Allington near Maidstone. The plant receiving the IBA (Ballast Phoenix at Ridham Dock) has a capacity of some 50,000 tonnes per annum. The mechanically processed IBA is used to produce drainage materials, concrete and bituminous coated products as an aggregate substitute. This operator continues to produce and market these materials in 2015.

4.2.3 Permanent sites are those that are reasonably anticipated to be operational well into the future. While those that are classified as semi-permanent are of a more limited, but not insignificant, life span. Temporary permissions are dependent on the productive life of the respective quarries where they are located and are not expected to remain over the next plan cycle in Kent.

4.2.4 The study is still (in Kent's third LAA) considered to yield indicative results of the productive capacity of the sector, rather than those that could be considered as definitive or absolute in type, given that there are temporary and semi-permanent mobile operations as well as permanent fixed sites. The survey period showed approximately 1.2 mt produced by the sector, though this is possibly an underestimate given that not all sites visited had data to share and the secondary aggregate production at Ridham (Ballast Phoenix Limited) was not part of the survey at the time.

4.2.5 Of the sites with permanent planning permissions, where there is available data, some 1.04 mtpa permitted capacity was recorded. The true figure would be higher as there were data gaps(exemplified, at the time, by four of the permanent sites visited being unable to supply meaningful data). It is also of note that there are often semi-permanent sites operating mobile plant at any one time linked to development projects that are not the subject of specific planning permissions or formal EA licensing requirements. This leads to data gaps in the overall amount of material produced by the construction and demolition sector.[(4.1)]

4.2.6 The past sales data for secondary and recycled aggregates for the annual aggregate monitoring (AM) exercise is tabulated below in Table 2. By interpreting the data of the permitted capacity and EA licence provisions, where they are available,

it is considered that Kent's overall permanent permitted capacity to generate secondary and recycled aggregates is in the order of 1.0 mtpa, with high probability that the true figure is well over a 1.0 mtpa, as evidenced by the peak figure in 2006, which showed a production level approaching 1.3 mtpa. Since 2006 production fell and has started to rise again, with the 2014 production figure of 673,410 mtpa. It should be noted that several operators have not returned their production figures for this LAA, and one of which has not participated in AM data sharing for several years. Therefore, the conclusions on Kent's production of recycled aggregates can only be seen as indicative.

Table 2 : Secondary and Recycled Aggregate sales in Kent 2002-2014(1)

Year	Recycled Aggregate	Secondary Aggregate	Totals	As a % of all aggregate materials produced in Kent (primary, secondary and recycled combined)
2002	340,025	135,025	475,050	475,050/6,218,861=7.6%
2003	511,888	157,333	669,221	669,221/6,444,618=10.34%
2004	ND	ND	ND	ND/2,287,026 (limited data)
2005	ND	ND	ND	ND/5,745,105 (limited data)
2006	1,181,412	113,224	1,294,636	1,294,636/7,546,311=17.15%
2007	794,026	162,257	956,283	956,283/6,662,722=14.35%
2008	475,163	72,841	548,004	548,004/6,232,065=8.80%
2009	843,974	59,237	903,211	903,211/5,778,744=15.60%
2010	657,987	51,934	709,921	709,921/5,551,743=12.78%
2011	686,329	88,278	774,607	774,607/5,247,569=14.80%
2012	643,577	24,997	668,574	668,574/4,696,273=14.24%
2013	660,642	81,824	836,462	836,462/ND
2014	673,410	55,304	728,714	728,714/4,381,964=16.63%
Totals 2006-14	6,616520	709,896	7,420,412	-
Average pa 2007-14	735,169 mt	78,877 mt	824,490 mt	range 8.8% to 17.15%

1. Recycled aggregates are of construction,demolition and excavation waste in origin, and secondary aggregates are from materials of industrial process origin, ND denotes no data

4.2.7 The important conclusions that can be drawn from these figures are:

- the sector is quite volatile changing markedly from year to year and the only possible 'trend' that can be deduced is that there was a general tendency to increase output till 2006, with a decline since that date.
- the average sales from the 2006 recorded peak (of 1.3 mtpa) for the last 9 years has been approximately 824,490mtpa for the secondary and recycled aggregates combined. As of 2014 the overall proportion of the secondary and recycled aggregate sector has not markedly increased, in that the landwon faction of supply to the market has marginally fallen from some 4.7 mt to 4.4 mt in 2014 compared to 2013, while the secondary and recycled aggregate sector grew from 14% to 17% as an overall proportion of supply

4.2.8 The role of secondary and recycled materials that can give rise to future supply is less certain than the primary aggregates where geological reserves can be calculated with a greater degree of certainty. The construction and demolition cycle is not a definitive or predictable activity. Also industrial processes that can give rise to secondary materials, and can similarly vary in response to changing economic circumstances, globally as well as locally. At present it can be reasonably stated that potentially between 10 to 15% of all aggregate need could be supplied by the secondary and recycled aggregates sector in Kent into the foreseeable future.

4.3 Marine Sources

4.3.1 Aggregates from the sea bed (in the North Sea and the English Channel) are an increasingly important resource. The material is derived mainly from the flint content of the Chalk (deposited in a extensive shallow tropical continental sea during the Upper Cretaceous epoch 90-79 million years ago) that was eroded by glacial melt water action and deposited on an expansive fluvial continental plain, laid down as meandering river channel and outwash fan deposits . As the Pleistocene Epoch Ice Age event came to an end there was a resulting increase in sea level that inundated the continental plain to form the North Sea and the Channel. These resources are now marine aggregate materials that are exploited from the sea bed today.

4.3.2 These deposits are not being replenished by marine sedimentary system inputs from elsewhere. The English Channel and North Sea are defined sedimentary basins and have a significant, but finite, resource similar in that regard to landwon resources. It can reasonably be anticipated that they will be available for the life of the KMWLP (2013-30) and beyond. The Crown Estate, who are responsible for licensing extraction operations, commented on Kent's Mineral Sites Plan, Preferred Options Consultation May 2012, and the following text is taken from its comments:

- *Over 900 million tonnes of marine sand and gravel (aggregate) has been dredged from offshore seabed over the last 50 years and at least 1,250 million tonnes is available for sustainable supply of construction aggregate over the next 50 years and beyond. Currently marine sand and gravel supply some 20% of the county's demand.*

- *The marine aggregate resource available in the East Coast, Thames Estuary and East English Channel areas and which are used to supply Kent wharves is 994 million tonnes of which 31.25 million tonnes is permitted for extraction per annum. Kent wharves only received some 1.3 million tonnes (4.2% of total permitted per annum) in 2010, but increased in 2011 with 1.55 million tonnes (5%). There is therefore a long term viable and sustainable supply of marine dredged aggregate both for construction uses and for direct beach nourishment by vessel delivery.*

- *The current rate of extraction by all companies to all marine aggregate wharves in the UK and on the European mainland is some 45% of the quantities permitted per annum thus reinforcing the sustainability and long term viability and requirement of marine aggregate wharves in Kent.*

4.3.3 The imports into Kent are running at an average (taken between 2006 and 2014) of just over 1.8 mtpa. Table 3 below details the landings in Kent during 2006-2014 recorded by yearly aggregate monitoring survey with the wharf operators in Kent. The differences between the Crown Estate figures above and those in Table 3 reflects the more detailed and very probably more accurate nature of the aggregate monitoring process (an average is calculated between 2006 and 2014 only due to poor data prior to 2006).

Table 3 Landings of Marine Dredged Sand and Gravel in Kent Wharves 2003-2014 (thousand tonnes per annum)[(1)]

2002	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average
1700	1830	ND	1950	1870	1670	1730	1524	1844	2014	1743	1938	1809

1. ND denotes no data

4.3.4 The wharves located in Kent (including those within Medway Council's control) have been jointly surveyed for their capacities in 2006 and in 2010; Table 4 below shows the comparative change between 2006 and 2010 of wharves in Kent. This has been changed as of April/May 2015 when during the Kent Minerals and Waste Local Plan 2013-30 Independent Examination a further potential wharf site was identified as one that can be re-activated for mineral importation (Old Sun Wharf), that is currently being used as a land served concrete products production facility in Gravesham Borough Council's administrative area.

Table 4 Kent and Medway Wharf Facilities[1] [2]

Site	Operator	Site size 2006 survey	Site size 2010 survey	Change between 2006-10
Ridham Dock	Tarmac PLc	Medium	Large	Increased capacity
Ridham Dock	Brett Aggregates Ltd	Medium	Medium	No change
Johnson's Wharf	Lafarge PLc	Medium	Large	Increased capacity
Robins Wharf	Aggregate Industries PLc	Medium	Medium	No change
Denton Wharf	Clubb Ltd	Large	Major	Increased capacity
Cliffe	*Brett Aggregates Ltd*	*Major*	*Major*	*No change*
East Quay Whitstable	Brett Aggregates Ltd	Medium	Medium	No change
Eurowharf Frindsbury	*Hanson PLc*	*Large*	*Major*	*Increased capacity*
Red Lion Wharf	Stema PLC	Large	Major	Increased capacity
Old Sun Wharf	Fleetmix Limited	Small	Small	No change (potential wharf re-activation site)
Isle of Grain	*Aggregate Industries PLC*	*Major*	*Major*	*No change*
Ramsgate New Port	Brett Aggregates Ltd	Small	Small	No change
Robins Wharf Northfleet	Brett Aggregates Ltd	Medium	Large	Increased capacity
42 Wharf (Northfleet)	Lafarge PLC	N/A	Small	New facility (not operational)
Dunkirk Jetty	Brett Aggregates Ltd	Medium	Medium	No change
Sheerness	Aggregate Industries Ltd	N/A	Small	New site (no longer operational as of August 2012)

Site	Operator	Site size 2006 survey	Site size 2010 survey	Change between 2006-10
Botony Marshes	Cemex PLc	Large	Major	Increased capacity

1. Small-up to 0.1 mtpa, Medium-0.1 to 0.35 mtpa, Major-0.75 plus mtpa
2. Entries in italics represent those wharves in the Medway Council administrative area

4.3.5 The 2010 survey demonstrated that several wharf operators (7 out of 17) had invested in increasing the capacity of their sites since 2006, resulting in an excess of 2 mtpa new importation capacity (estimated). A combined capacity of some 4.65 plus mtpa (estimated) was extant in 2010. The changes included new processing and conveyor plant, as well as 'value addition' facilities such as concrete batching plants. One site (small capacity of up to 0.1 mtpa) ceased operating in 2012.

4.3.6 The very significant increased capacity event in recent years is the planning permission to use 42 Wharf at Northfleet for aggregates following the closure of the onsite cement works. Planning permission for up to 3 mtpa aggregate importation was granted in 2011. The site has been utilised for the Cross Rail project. This has now ceased, thus allowing cement and aggregates importation and handling to come on stream, although this is yet to occur. Overall Kent wharves have a total combined capacity in the order of 8 mtpa (estimated).

4.3.7 The Kent and Medway 2010 wharf survey was conducted on the basis that the individual wharf operators would provide KCC with data as long as it was not reported in a manner that would enable individual wharf capacity to be apparent, as this would be a breach of the confidentiality so agreed between the parties. The existing overall wharf capacity (railhead capacity will be examined under the following import and export balance section) is greater than the operational throughputs that have been recorded by the annual aggregate monitoring surveys to date. Therefore, if increased importation of both marine and landwon sands and gravels and crushed rock via the area's wharfs (excluding Medway) is increasingly required in the future, additional capacity will be available. This is provided that there are no significant losses of wharf infrastructure to other development or operational requirements/restrictions imposed on the operators that result in the abandonment of sites.

End Notes

4.1 Further work in support of the Plan's Examination has been done to provide an assessment of the secondary and recycled aggregate productive capacity operating within Kent in 2014. This includes processing plant based on landfills used to produce materials that may be used on the landfill sites for restoration or engineering purposes. A value of circa 2.7 mtpa overall has been calculated, and split between 2.1 mtpa of permanent capacity and 0.63mtpa temporary capacity. Given that significant tonnages of processed material would be utilised on-site, the actual sales figures captured by the Annual Monitoring exercise would be expected to be significantly lower. This 'snapshot' value is considered to provide a useful indicator of activity overall

5 Import and Export Balance

5.1 Import and Export Balance

5.1.1 The 2009 Aggregate Mineral Survey for England and Wales (AM2009) undertaken by British Geological Survey(BGS) on behalf of DCLG [(5)] provided an in-depth understanding of regional and national aggregate sales, inter-regional sales, transportation and consumption of all the primary aggregate streams, another such study is currently being undertaken for AM2014. However at the time of writing the inter and intra regional flows of aggregate imports/exports are not available from the BGS. Therefore, this LAA will continue to take the position as found in AM2009 as indicative of the situation in 2014, until such time as revised data is available prior to ratification of the third Kent LAA by the AWP.

5.1.2 The survey was only a 'snapshot' in time, and with Kent and Medway's statistics being combined such that they cannot be seen in isolation, this limits the usefulness of survey for the Kent area. The inherent value of these more in-depth surveys is that they have been conducted at four yearly intervals since 1973 and afford a national and regional analysis of long-term trends. The yearly aggregate monitoring has less scope and thus is of more local and regional value. Table 5 details the available information taken from the yearly AM and annual monitoring reports (AMR). This was then further extrapolated to gain an understanding of the import and export balance of Kent and Medway.

5.1.3 The data from the AM2009 compilation report shows Kent and Medway is a net exporter of the landwon sand and gravel aggregate resource, though it is not marked at 13.4% of the overall landwon sand and gravel production. Marine sands and gravels landed in Kent and Medway show a similar pattern, as 22.6% were exported out of the joint survey area.

5.1.4 For the landwon hard rock there is a marked contrast between the two areas. Medway has no hard rock geology so all of the crushed rock recorded is imported, some possibly consumed while a significant amount of the 1.86 mt recorded sales in 2009 were in all probability exported. Kent has substantial landwon resources in addition to that which is also imported by sea and rail. Overall consumption of this material in the combined areas was recorded as 52.9%.

5.1.5 Taking all primary aggregates together Kent and Medway in 2009 was an overall net exporter. In the region of 8.25 mt was produced within the two areas, with total consumption being 5.7mt or 69.2% of the production achieved. Exports were calculated to be 2.6 mt or 31% of the overall primary aggregate production. This demonstrates that the majority of primary aggregates both produced and imported into the Kent and Medway areas were used within these administrative areas. Table

5 Online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6366/1909597.pdf

5 below details the importation, exportation and consumption of aggregates in Kent and Medway combined as detailed in the collation report of the 2009 aggregate minerals survey for England and Wales.

Table 5 Imports, Exports and Consumption of Primary aggregates in Kent and Medway in 2009 (quantitative data in thousands of tonnes)

	Landwon Sand and Gravel Kent and Medway (1)	Marine Sands and Gravel Kent and Medway	Crushed Rock (2)	All primary aggregates production
A. Overall aggregate produced in Kent and Medway as expressed as sales	1362	3127	3760	8249
B. Exported out of Kent and Medway (assumed as A-C)	183	585	1770	2580
C. Consumption in Kent and Medway (3)	*1179*	*2542*	*1990*	*5710*
D. Imported into Kent and Medway (*data from the same source as row C. above*)	*79*	*186*	*340*	*602*
E. Total overall consumption in Kent and Medway (C+D)	1258	2728	2330	6312
Overall Import (-ve) and export (+ve) balance in tonnes (x 1,000)	+104 7.64% of all material produced was not consumed in the area	+399 12.76% of all material produced was not consumed in the area	+1430 38% of all material produced was not consumed in the area	+1937 23.48% of all material produced was not consumed in the area

1. Minimal landwon sand and gravel production in Medway (9,900 tonnes) for 2009
2. Crushed rock imports and landwon combined were 1.9 mt in Kent and 1.86 mt imports into Medway for 2009
3. Figures taken from Collation of the results of the 2009 aggregate minerals survey for England and Wales

5.1.6 Examining the recorded destinations of the landwon and marine dredged sand and gravels and crushed rock sales for Kent (the AM2009 collation report does give this information for Kent separate from Medway) demonstrates that Kent does indeed consume most of the production (81% and 86% for the landwon and marine sands and gravels respectively) and makes a significant contribution to the rest of the South East (6% landwon sands and gravels, 3% marine dredged sands and gravels and 2.9% for hard rock). Though a greater amount of sands and gravels travel out of the region to elsewhere than are consumed as exports to the South East Region. Table 6 [(6)]details the 2009 sales destination findings for Kent.

Table 6 : Primary Landwon and Marine Aggregates Destinations when Sold from Kent (quantitative data in thousands of tonnes)

Destination	Landwon Sand and Gravel	%	Marine dredged Aggregates	%	Land-won Crushed Rock	%
Kent	1103	81%	1442	86%	True figure confidential 780 used in lieu of actual production figure	86.4%
Rest of South East	75	6%	55	3%	26	2.9%
Elsewhere	177	13%	171	10%	0	0%
Unallocated	8	>1%	0	0%	97	10.7%
Total	1362	-	1668	-	883	-

6 SEEAWP technical Secretary communicated the following to KCC *"the crushed rock sales for Kent in the AM reports for the SE region have been recorded as confidential over the last 10 years because there have been only one or two quarries operating. However, if the figure for Oxfordshire is subtracted from the published totals, and in the knowledge that sales in the Isle of Wight and West Sussex are very small, I agree that it is reasonable for you (KCC) to draw the conclusion that sales in Kent have reflected the SE Plan apportionment"* this figure being 0.78 mt pa

5.1.7 The above data demonstrates that the predominance of Kent's landwon and marine primary aggregates remained in Kent and was consumed locally in 2009. The wharves in Kent and Medway are used for the importation of materials other than marine dredged aggregates from the sea floor (including land-won aggregates from elsewhere, cement and recycled and secondary materials that may yield aggregates but also include such materials as waste glass, plastics and paper), and Kent's railheads also have significant capacity that is used to supply aggregate needs as imports. Table 7 demonstrates the historic combined wharf and rail imported supply into Kent.

Table 7 Aggregate Railhead Imports and Wharf Landings Combined in Kent

Year	Soft Sands[7]	Sharp Sands and Gravel[8]	Crushed Rock[9]	Secondary Aggregate	Recycled Aggregate	Total
2003	8,685	1,732,535	1,404,980	ND[10]	ND	3,146,200
2004	15,400	1,848,597	1,434,911	ND	ND	3,298,908
2005[11]	ND	1,669,000	1,980,000	ND	ND	Limited data
2006	11,659	2,165,293	1,094,716	ND	ND	3,271,668
2007	13,794	2,127,547	1,561,169	ND	ND	3,702,510
2008	9,668	1,972,253	1,284,977	ND	ND	3,266,898
2009	14,922	1,761,062	1,023,748	ND	ND	2,799,732
2010	18,200	1,674,408	1,006,309	ND	ND	3,228,203
2011	15,950	2,013,624	1,196,379	ND	ND	2,890,571
2012	23,069	2,180,090	703,263	ND	ND	2,906,422
2013	15,214	1,769,325	873,119	ND	ND	2,657,658
2014	9,798	1,970,900	1,073,359	ND	ND	3,054,057

9 Landwon in origin from outside Kent including that sold for engineering bulk fill purposes
8 Landwon and marine in origin for aggregate use
7 Landwon and marine sources outside Kent
10 ND indicates no data available
11 Kent and Medway combined data in SEERAWP Annual Report 2005

Year	Soft Sands[7]	Sharp Sands and Gravel[8]	Crushed Rock[9]	Secondary Aggregate	Recycled Aggregate	Total
Last 3 years average 2012-14	16,027	1,973,438	883,247	ND	ND	2,872,712
Last 7 years average 2008-14	15,260	1,624,666	1,023,022	ND	ND	2,971,934

5.1.8 The data for Table 7 was taken from past AM (including AM2014) surveys collated in an aggregated form. The importance of the importation capacity in Kent to meet the overall need is well demonstrated by the data. In 2012 approximately 2.90 mt of primary aggregates was imported into Kent via wharves and railheads. In 2013 the figure dropped to 2.65 Mt, and then it has risen to 3.05 mt in 2014.

5.1.9 Total aggregate sales in Kent of all types and via all means (including secondary and recycled materials) amounted to 4.4 mt in 2012 and 4.6 mt in 2013. Thus imports via wharves and railheads represented some 66% and 57.6% of Kent's overall aggregate supply in 2012 and 2013 respectively. Although Kent is a limited net exporter of aggregate materials, the role of importation via wharves and railheads in meeting Kent's own needs remains significant. Full details of all aggregate sales was not known at the time of writing given incomplete returns from the secondary and recycled materials producers, though it is anticipated that the share of imports in Kent's overall needs is likely to have increased as per the trend identified between 2012 and 2013; given reductions in landwon aggregate (sands and gravel) production and the observed rise (some 13% increase compared to 2013) of imports in 2014.

5.2 Future Import Supply Security into Kent

5.2.1 The reliability of supply from other areas outside Kent was examined in the second Kent LAA. Although the actual details are confidential the 'spread of data' accrued from discussions with other MPAs which export aggregates into Kent and suppliers were informative. Though this exercise has not been updated to any marked

9 Landwon in origin from outside Kent including that sold for engineering bulk fill purposes
8 Landwon and marine in origin for aggregate use
7 Landwon and marine sources outside Kent

extent the relationship with Essex County Council, as given in the Statement of Common Ground in Appendix C remains in place. Many of the importers who import to Kent own and operate quarries internationally as well as importation infrastructure in Kent. The international imports materials come from Denmark, France, Ireland, Norway and the Netherlands. The majority of these aggregate imports are crushed rock, though land-won sand and gravel is also represented. Of the elements of Norwegian and Danish supply, certain reserves are substantial, being in the order of 70 plus years and at least 49 years respectively. Not all of the international importers confirmed the permitted life of the supplying quarries. Internal imports, (i.e. those supplies from other parts of the United Kingdom into Kent) are again dominated by crushed rock. The materials originate from the Cornwall, Scotland, the Mendips (Somerset) and Wales. Many of the respective quarries have planning permissions that will last into the 2040's.

5.2.2 East Sussex County Council confirmed that landwon sand and gravel extraction at Scotney Court Quarry, Lydd had moved into its administrative area in 2013. This remains to be the case in 2014 where the remaining reserves in Kent are below the processing plant within the site. The original planning permission straddled the administrative areas of both East Sussex and Kent, the majority being in Kent. However, the extraction of the aggregate materials has now moved from Kent to East Sussex. The processing plant site is, as it is stated, in Kent. For AM purposes the site produces an East Sussex production figure and an importation figure into Kent. In addition, some marine dredged sand is leaving East Sussex and being imported into Kent.

5.2.3 The situation in West Sussex is that since 2009 aggregate materials in the order of 10-15,000 tonnes were imported into Kent. Monitoring data will confirm if this is a new trend over the next few years. What is apparent is that sand and gravel importation is a minor element of Kent's imports that are dominated by crushed rock.

5.2.4 Overall it can be concluded that the limitations of land-won sands and gravels can be offset by marine resources; section 4 above details they are available to Kent, in relative abundance. With regard to crushed rock, Kent has an abundance of landwon supply, though this material is supplemented by significant imports to meet the range of technical requirements of construction activity. It is a reasonable assumption that this pattern will continue into the foreseeable future.

6 Sub-regional Land-won Primary Aggregate Apportionment and Comparison with the NPPF 10-year Rolling Average in Kent

6.1 Sub-regional Land-won Primary Aggregate Apportionment and Comparison with the NPPF 10 year Rolling Average in Kent

6.1.1 The national and regional guidelines in 2003 aggregated Kent and Medway together into the South East England Region. The government issued revised guidelines in 2009 these were lower than the 2003 for the South East England Region. The provision indicated was 195 mt of landwon sand and gravel and 25 mt of crushed rock per annum in the period 2005-2020. The Regional Spatial Strategy (RSS) which was called the South East Plan, apportioned these guideline quantities sub-regionally; initially both Kent and Medway were combined in Policy M3. The guidelines remain in force at this time though the RSS is now substantially revoked with no mineral policies remaining in force.

6.1.2 Policy M3 of the RSS was subject to an early partial review in 2009 leading to an Examination in Public (EiP). The EiP's Panel proposed changes to the Secretary of State, who published his findings in 2010. The Panel recommended that the apportionment figure for the South East of England region be 11.12 mtpa for sand and gravel and 1.44 mtpa for crushed rock, both from land-won resources. The Panel went on to conclude that the apportionment to the sub-regions should reflect the option (several were considered) that provided a balance between the demands for and the presence of the resource with regard to the environmental factors and constraints "*capable of assessment consistently across the region at a level of detail commensurate with the purpose of a regional spatial strategy*".

6.1.3 Consistent with this approach the sub-regional apportionments for Kent were 1.63 mtpa for sand and gravel and 0.78 mtpa for crushed rock from the land resource. The Panel's recommendations were accepted by the Secretary of State and Kent County Council raised no objection in responding to the following consultation on the RSS's proposed changes as set out in Table 8 below.

Table 8 : Primary Aggregates Apportionment in Kent in South East England Regional Spatial Strategy

Land-won Resources	South East Plan	South East Plan; Early Partial Review (2010)
Sand and Gravel	2.53 mtpa(1)	1.63 mtpa
Crushed Rock (ragstone)	1.2 mtpa	0.78 mtpa

1. Includes Medway

6.2 Kent Land-won Sands and Gravels

6.2.1 Production of all landwon sand and gravel (plus Hoggin) in Kent has averaged 0.99 mtpa over the last 5 years, and 1.40 mtpa over the past 10 years, see Table 9 (full per year table in Appendix D, Table 26). In 2013 the LAA demonstrated a 10 year average of 1.56 mtpa for all landwon sands and gravels, a drop of 0.16 mtpa. It is considered likely that the 10-year rolling average figures for landwon sand and gravel in Kent will continue to drop annually into the future. With consecutive loss of output post 2011 due to one of Kent's significant sand and gravel quarries having moved its production across the administrative boundary into East Sussex, thereby reducing overall output in Kent and depressing the 10 year average calculation to some extent from 2011 onwards.

Table 9 Kent all Landwon Sand and Gravel plus Construction Bulk Fill Aggregate and Hoggin Sales 2005-14

Year	Tonnes
Average sales 2012-14 (3 years)	0.82 mtpa
Average sales 2010-14 (5 years)	0.99 mtpa
Average sales 2005-14 (10 years)	1.40 mtpa

6.2.2 If bulk engineering fill aggregates and Hoggin sales are set aside as a more marginal (though not always insignificant) use of resources, a more focused analysis of the aggregate use demand can be calculated. Sales of this material are variable and may be said to have a distorting effect on the analysis of land won sand and gravel demands. Table 10 below shows the County's recorded sales of Hoggin, it is apparent that this materials demand is volatile and likely to be very different from other aggregate materials.

Table 10 Kent Landwon Hoggin Sales 2005-14

Years	Sales in tonnes	Averages
2005	ND	2012-14 lack of meaningful data
2006	310,657	
2007	63,780	
2008	12,460	
2009	ND	2010-14 2,758 tonnes unrepresentative due to a lack of meaningful data

Years	Sales in tonnes	Averages
2010	3,802	
2011	9,759	
2012	228	
2013	0	2005-14 40,069 tonnes
2014	ND	

6.2.3 Table 11 below shows the average sales data (refer to table 30 in Appendix D for a full breakdown) without the very potentially distorting effect of Hoggin sales. The recent economic recession of 2008 to 2009 has clearly depressed sales of over the 10 year average, however the 1.3 mt average for all landwon sands and gravels in the county is 6.3% lower than that calculated for the second Kent LAA, at 1.4 mtpa. This may be indicative of landwon available reserves depleting in overall supply irrespective of the current UK economic cycle.

Table 11 Kent Landwon Soft and Sharp sand and Gravel Sales 2005-14 (excluding Hoggin and bulk fill aggregate sales)

Year	Tonnes
Average sales 2012-14 (3 years)	0.82 mtpa
Average sales 2010-14 (5 years)	0.98 mtpa
Average sales 2005-14 (10 years)	1.34 mtpa

6.3 Kent Land-won Crushed Rock (Ragstone)

6.3.1 As reported in the second LAA, after 2001 the requisite number of operational hard rock quarries in Kent fell below the number that ensured a degree of confidentiality in any figures if openly reported. Therefore, an alternative approach was taken in the second Kent LAA and this remains the case into Kent's third LAA.

6.3.2 Table 12 below details the sales data since 1998 for Kent. A 10 year average is not possible given the confidentiality issue. Only two sites operate in Kent as of 2002. As indicated in Table 12 below the Technical Secretary of SEEAWP confirmed that it is reasonable for KCC to conclude that land-won crushed rock sales in Kent have reflected the revised South East Plan Policy M3 apportionment of 0.78 mtpa. As of 2014 this situation has not altered.

Table 12 Kent Landwon Crushed Rock sales 1998-2014(1)

Year	Thousand Tonnes
1998	700
1999	700
2000	954
2001	1,240 (figure rounded to preserve confidentiality)
2002 through to 2014	**C**
Average 2002-14	**C** a working figure being 0.78 mtpa is being advocated for plan monitoring purposes

1. **C** denotes restricted data

6.3.3 In the absence of a 10 year average, the 0.78 mtpa RSS apportionment figure will continue to act as a substitute to the 10 year average sales figure normally required by the NPPF for LAA purposes.

6.4 Past Land-won Aggregate Sales Data for Kent

6.4.1 Tables 13 and 14 below detail the past sales data for the sharp sands and gravel and the soft sands from the landwon resource in Kent. These aggregates have different markets: soft sands are used in mortar and asphalt products and sharp sands and gravel in concrete and concrete related products (such as pre-cast structural concrete components). Table 13 (full yearly sales details are to be found in Appendix D Table 30) below shows the sales data for sharp sands and gravels. There are reductions since 2010 that are anticipated to continue given the reduction of production output in Kent to East Sussex at Scotney Court Quarry at Lydd, as the quarry's operational area has crossed the administrative boundary(12).

Table 13 Kent Landwon Sharp Sand and Gravel Sales 2004-14

Year	Tonnes
Average sales 2012-14 (3 years)	0.42 mtpa
Average sales 2010-14 (5 years)	0.53 mtpa

12 SEEAWP report for AM2013 reflects the shift of sales data at Lydd to East Sussex and has split the overall production from this site as 50% Kent and 50% East Sussex, how this relationship has changed in 2014 will be considered in AM2014

Year	Tonnes
Average sales 2005-14 (10 years)	0.70 mtpa

6.4.2 The 10 year rolling average has reduced from 0.78mtpa to 0.70mtpa, and it may decline through time, given that the last three years average sales indicates a potential trend of continued reduced output (from 0.51 mtpa in the LAA for 2013 to 0.42mtpa in Kent's third LAA). It might have been reasonable to assume that a general economic recovery after the 2008-09 recession would have the affect of increasing yearly output and raise the 10 year rolling average figure. This appears to have not occurred as sales have declined. Reductions in the overall proportion of aggregates from the landwon resource may account for this observation.

6.4.3 Table 14 below (full per year sales details for both soft sand and sharp sand and gravels are to be found in Appendix D Tables 30,31 and 33) shows the sales data from AM surveys for Kent's soft sands.

Table 14 Kent Landwon Soft Sand sales 2005-14

Year	Tonnes
Average sales 2012-14 (3 years)	0.39 mtpa
Average sales 2010-14 (5 years)	0.44 mtpa
Average sales 2005-14 (10 years)	0.61 mtpa

6.4.4 The pattern of past soft sand sales show a recent decline, the last three year sales average show production is well below the 10 year average. Though the quantities are of a lower magnitude of the sharp sands and gravels sales, a similar pattern can be observed. The effects of the economic recession from 2008 to 2009 no doubt continues to have some depressive effect on the 3 and 5 year average sales calculations for both aggregate types, possibly to a greater proportion than the 10 year sales average figure. The 10 year average for 2014 is 0.01 mtpa lower than the same average calculated on 2013 data, a 6% overall reduction in soft sand sales. Given the greater permitted reserve base (to be more fully considered next in section 7)of the soft sands than the sharp sands and gravels this reduction may be considered more reliable reflecting prevailing economic conditions acting to reduce demand.

7 Assessment of Permitted Reserves in Kent

7.1 Assessment of Permitted Reserves in Kent

7.1.1 Aggregate reserves constitute the physical quantities of materials that are identified by an extant planning permission that can be identified as remaining at any given point in time. Data for this can come from the mandatory annual monitoring exercises undertaken by the County Council as the mineral planning authority in Kent. Aggregate resources relate to the estimated (in most cases) geological extent of potentially economic mineral deposits present in an area, generally free of major planning constraints. Again data for this comes from annual monitoring.

7.1.2 Permitted reserves can include dormant and currently non-working sites. Also, inactive and dormant sites that have been agreed by the industry as unlikely to ever be worked again are to be excluded from landbank calculations. Table 15 below details the extent of Kent's landbank of permitted aggregate reserves in the AM2014 survey data, which records data of the previous 12 months sales and the reserves as of the end of that year (2014).

Table 15 Permitted Reserves: Construction Aggregates as End of 2014

Type	Total Permitted Reserves (mt)
Sharp Sand and Gravel (including sandstone gravels)	2.64 mt no new permissions in 2014
Sand and Gravel or Hoggin[(1)] For use as construction bulk fill	uncertain no new permissions in 2014
Soft Sands[(2)]	8.04 mt no new permissions in 2014
Hard Crushed Rock (Ragstone)	Current reserves confidential though estimated to be in the region of 40-50 mt, no new permissions in 2014

1. Hoggin is a compactable ground cover that is composed of a mixture clay, sand and gravel. It is an engineering grade mineral often used for bulk fill, and is unsuitable for other applications without extensive processing
2. no longer including reserve figure for Aylesford Sandpit

7.1.3 Compared to the reserve position found in the second Kent LAA in 2013 all the principal aggregate mineral types have reduced reserve bases. The sharp sands and gravels reduced by almost 27%, the soft sands by 30% and the hard rock reserves commensurate with what is understood to be the yearly draw down proxy figure of 0.78 mtpa. This means only a very modest reduction in reserves of Kent's hard rock (some 1.56% to 1.95%) reserves compared to that which existed at the end of 2013.

8 Kent Landbank Calculations

8.1 Kent Sharp Sands and Gravels

8.1.1 If both soft sands and sharp sands and gravels are combined, the overall permitted sand and gravel reserves in Kent are substantial. Considered in this way permitted reserves amount to 12.68 mt (as of the end of 2014). A simple landbank calculation based on the reserve figure divided by the 10 year average gives some 9.22 years of reserves, some 2.22 years greater than a 7 year landbank, however the NPPF requires a maintained rolling 7 year landbank. Table 16 below details these calculations:

Table 16 Sharp and Soft Sands and Gravel Combined Landbank in Kent 2014

10 Year Sales Average 2005-14 (A)	1.375 mtpa
Permitted Reserves as End of 2014 (B)	12.68 mt (excluding Hoggin materials)
Current Landbank Duration (B divided by A)	9.22 years
Maintained Landbank Required by NPPF (1.375 mtpa being maintained held at a quantum equal to 7 years average production)	9.625 mtpa
Current landbank 12.68 mt /9.625 mtpa for a 7 year landbank in any one year	1.3 years maintained NPPF compliant landbank

8.1.2 However, the two geologies are distinctly different. Soft sands are a sequential unit (the Folkestone Beds) of Kent's stratigraphy with more than a superficial occurrence. They form an important part of the county's geological structure. The sharp sands and gravels have a superficial occurrence, in that they are surface deposits of geologically recent processes and have significantly different characteristics to soft sands. As a result of their inherent differences both serve essentially different markets (i.e mortar and concrete products). While the national and regional aggregate guidelines do not differentiate between the different types of sands and gravel. The DCLG planning policy guidance issued in March 2014 requires MPAs to calculate and maintain separate landbanks for aggregate materials of a specific type or quantity which have a distinct and separate market. The online guidance states:

" For some types of aggregate (such as high quality polished stone value, concreting sand and building sand), it will be necessary to carry out a separate assessment for different types of aggregate in preparing a Local Aggregate Assessment. This is critical to ensure that the quality of aggregate is appropriate for its intended use, since not all aggregates can be used for all construction purposes."

8.1.3 The second Kent LAA (for 2014 and ratified in early 2015 by the AWP) did not differentiate between the sand and gravels available in Kent. At the time the Council was reliant on the national and regional guidelines and the NPPF. Neither differentiate between the different types of sands and gravel. The situation for the second and now third Kent LAA is that Government guidance now allows for separate landbanks for distinctly different aggregate mineral types to be considered.

8.1.4 The current simple landbank position with regard to the sharp sands and gravel in Kent is shown in Table 17 below:

Table 17 Kent's Sharp Sands and Gravel Landbank in 2014

Requirements	Computation results to meet NPPF Landbank Requirements
10 Year Sales Average 2005-14 (A)	0.70 mtpa
Permitted Reserves at End of 2014 (B)	2.64 mt
Current Landbank Duration (B divided by A)	3.77 years
Maintain Landbank Required by the NPPF (0.70 mtpa average based on 10 years of production held at a quantum as reserves equal to 7 years average production)	Maintain 4.9 mt of available reserves in any one year (equal to 7 years of average production)
Current landbank 2.64 mt, 4.9 mtpa required for a 7 year landbank to be maintained in any one year	0 years maintained NPPF compliant landbank

8.1.5 Kent's permitted reserves of sharp sands and gravels fall short of providing a simple 7 year land-bank based on the predicted average rate of extraction of 0.70 mtpa, it falls short by by 2.25 mt and would only last 3.77 years as of the end of 2014. Correspondingly a maintained 7 year landbank, as required by the NPPF, for sharp sands and gravels based on available reserves is simply not possible in Kent.

8.2 Kent Soft Sands

8.2.1 Table 18 below demonstrates that there is a relative abundance of reserves for soft sands in the County Council's area, though a significant permitted reserve at Aylesford Sandpit has been (during 2015) re-classified as predominantly a silica sand site. Remaining soft sand reserves at the site are relatively minor, such that most all its remaining permitted reserves (some 3-5 million tonnes depending on the interpretation of the extant planning permission) are below water table silica sands. These materials are an industrial sand in their application and thus have been

removed from the permitted aggregate landbank in Kent. Notwithstanding this loss of reserve, the permitted landbank across the county is in excess of the landbank requirements based on the 10 year rolling sales average for this mineral.

Table 18 Soft Sands Landbank in Kent 2014

Requirements	**Computation results to meet NPPF Landbank Requirements**
10 Year Sales Average 2005-2014 (A)	0.601 mtpa
Permitted Reserves as End of 2014 (B)	8.04 mt[(1)]
Current Landbank Duration (B divided by A)	13.4 years
Maintain Landbank Required of NPPF (0.61 mtpa average based on 10 years of production held at a quantum of reserves equal to 7 years average production)	Maintain 4.207 mt of available reserves in any one year (equal to 7 years of average production)
Current Landbank 8.04 mt, requirement of 4.207mt reserves for a 7 year maintained landbank in any one year	6 years maintained NPPF compliant landbank

1. The permitted reserves as of the end of 2014 assumes the majority of the sand reserves at Nepicar Farm Quarry are industrial in type and are not counted as soft sand

8.2.2 The current landbank of soft sands is sufficient for a 7 year NPPF compliant landbank to be maintained for approximately 6 years, while a simple landbank calculation based on the predicted rate of depletion would last almost 13-14 years (until 2025-26). The previous, second Kent LAA, highlighted a concern that individual sites may have a degree of interchangeability with markets for silica sand (often referred to as industrial sands and are classified as a non-aggregate mineral) as well as those for aggregate soft sands. In order to clarify the nature of the soft sand reserves the current operators of such sites have all been contacted to determine the degree to which sites can supply both markets from the sands in the overall permitted quarry area. As of the time of writing most of the operators have responded. Those that have a degree of silica sand within their soft sand quarries are clear that they differentiate accurately the materials supplied to market such that the integrity of the AM returns is being maintained.

8.2.3 Therefore, the County Council has concluded that the overall soft sand landbank calculations are representative of the reserve base in Kent[13].

8.3 Kent Crushed Hard Rock

8.3.1 Given the need to preserve the confidentiality of only two hard rock (Ragstone) operators left in the County, the yearly production and thus the 10 year rolling average is an estimate only. As discussed earlier (see Section 5.1.5) this is based on the apportionment that Kent had received in the revised RSS Policy M3.

8.3.2 It is quite clear from Table 19 that Kent has a significant landbank of reserves that can be projected well past the anticipated Kent Minerals and Waste Local Plan's time span of 2013-30. The landbank required to be maintained throughout a plan for crushed rock is 10 years, thus 7.8 million tonnes of permitted reserves should be available in any one year.

Table 19 Hard Rock (Ragstone) Landbank in Kent 2005-14

10 Year Sales Average 2005-2014 (A)	0.78 mtpa
Permitted Reserves (B) as End of 2012	Actual figure is confidential though estimated at over 48 mt[1]
Current Landbank (B/A) Duration	61 years
Maintained Landbank Required by NPPF (0.78 mtpa for 10 years)	7.8 mtpa to be maintained in any one year gives a 7 year maintained landbank

1. Including recent 2013 planning permission for 16.67 mt

8.3.3 The hard rock reserves in Kent are substantial, a simply landbank that is being depleted by an estimated 0.78 mtpa will last for 61 plus years. A maintained 10, NPPF compliant landbank that requires at least 10 years of permitted reserves to be maintained in any one year would be maintained through the emerging Plan period, with some 34.18 mt of reserves remaining in 2030.

13 The Kent County Council received a representation to the Plan submitted for Examination from the new owners of Aylesford Sand Pit who refute past AM data records of soft sand reserves in late 2014. It is contended that 4 mt of permitted sand reserves (previously identified by monitoring as soft sands) at this site are in fact un-viable silica sands. This information was considered at the Plan's Examination Hearings in April/May 2015 and the soft sand permitted reserve calculation has been revised downwards in Kent's third LAA

9 Anticipated Construction and Maintenance Demand for Aggregates in Kent

9.1 Anticipated Construction and Maintenance Demand for Aggregates in Kent

9.1.1 In Kent, there has been an observed decline recently in sales of sands and gravels. From a high of 1.2 mt in 2009 to 0.4 mt in 2012 for soft sands and from a high of 1.17 mt in 2005 to 0.65 mt in 2012 for sharp sands and gravels. This trend has continued with an observed fall in the ten year sales average from 0.78 mtpa to 0.70 mtpa for sharp sands and gravels. The reasons for the decline may be associated with the recessional event since 2008 and a number of other factors. Such as a reduction in the intensity of aggregate use in construction design, greater use of alternatives to landwon aggregates from the recycled and secondary aggregate sector (in Kent this has grown from 0.475 mt in 2003 to 0.77 mt in 2012). The quantitative demand for landwon aggregates in Kent will be a function of the construction and maintenance activity over the coming years, as well as other influences, such as materials substitution and lowered intensity of use by design.

9.1.2 While it will not be possible to predict how the intensity of aggregate use in design will change, and the ultimate degree of primary aggregate substitution that will affect demand, it is reasonable to conclude that the level of construction and maintenance activity in Kent can be assessed. Thus, given certain assumptions, the level of primary aggregate demand in Kent over time can also be assessed. The second Kent LAA looked at housing projections and other indicators, such as significant infrastructure projects in the pipeline that may be used to estimate construction aggregate needs into the future, as compared to arithmetic projection of averaged past sales projections. The results were somewhat uncertain though the process can be up dated with the more recent housing projections available to determine if any higher degree of certainty is afforded by this methodology.

9.2 Assumptions of the Intensity of Aggregate Use in Housing Construction Major Projects Education Infrastructure Highways Infrastructure and Maintenance

Housing Construction

9.2.1 The British Geological Society has jointly produced a document "*Planning4Minerals: A Guide on Aggregates*". The information is in the form of a handbook jointly prepared by the Quarry Products Association (now the Mineral Products Association), Marine Aggregate Producers Association and Entec UK Ltd. (2006). The handbook advises that an average of 60 tonnes of aggregates are required per home. Page 8 paragraph 2.1.1 of the handbook states:

- *Most notably, in a typical year, the UK's quarrying network helps to provide: 180 000 new homes (each requiring an average of 60 tonnes of aggregates)*

9.2.2 There is no breakdown of what aggregate type predominates in housing construction, though it can be assumed it takes up soft sands for mortar use as well as concreting aggregates for foundations.

9.2.3 Data on most recent housing projections in Kent can be ascertained from district council housing needs studies prepared to support local plan preparation. This data can be balanced with recent past housing delivery performance across the county, and includes:

- Housing Projections Kent 2012-31(21 years); 123,157projected, or 5,865 per annum (a reduction of 6.9% on previous projections)

9.2.4 The application of the assumed 60 tonnes per house consumption means that for the housing sector 351,900 tonnes are required per annum. Meaning that a total of 7,038,000 tonnes between 2011 and 2031 are necessary to provide for the Kent (excluding Medway) wide projected housing growth.

Education Infrastructure

9.2.5 KCC has a statutory responsibility to provide the county's educational infrastructure, namely new and expanded schools. For the period 2015-31 the total projected cost is estimated to be some £720 million. This includes a 190.2 million funding gap shortfall, though it is considered that for the purposes of the third LAA the projected expenditure will be realised[(14)]. The aggregate usage of this construction spend is difficult to estimate. The data prepared by the BGS for the Communities and Local Government Mineral Planning Factsheet, Construction aggregates; issued June 2013 gives the following data on the intensity of aggregate construction usage per £1,000 or construction output, as of 2010:

- sand and gravel approx. 0.5 tonnes
- crushed rock approx. 0.75 tonnes
- total aggregates approx 1.3 tonnes

9.2.6 Therefore, for every £1,000 spend on construction output 1.3 tonnes of aggregates are used. It could be the case that in Kent the education sector may require 939,120 tonnes of aggregates between 2015 and 2031. The use of the differentiated sand and gravel and the crushed rock intensity of use ratios rather than the overall aggregate ratio of 1.3 tonnes per £1,000 of construction output may give a greater resolution to the different aggregate demands that may flow from this area of demand in Kent. Though use of the the 1.3 tonnes for every £1,000 of construction output ratio does have the benefit of a degree of certainty as to the upper limits of the sector's possible requirements. Moreover, It is difficult to see where the right balance between the use of the different aggregates of would be, use of the higher figure is unlikely to be significantly greater than the simple addition of the calculations for sands and gravel and crushed rock combined.

14 Information from the County Council's Growth and Infrastructure Framework, 2015

Major Projects (non-infrastructure) - Paramount Park

9.2.7 The second LAA detailed the potential for non-infrastructural major project that may occur over the plan period. The situation has not materially altered. The following projects have been identified and remain to be realised.

9.2.8 Paramount Park leisure development on the site of a former cement manufacturing site on the Swanscombe Peninsula, near Dartford in north Kent. The construction spend is estimated at £2 billion. Using the BGS data on the intensity of aggregate construction usage (including the overall 1.3 tonnes per £,1000 of construction output ratio given the lack of data of what the division between crushed rock and sands and gravel would be in this capital project) the requirements of this project are as follows:

- use intensity of sand and gravel 1,000,000 tonnes (0.5 tonnes per £1,000 of construction output for a £2 billion project)
- use intensity of crushed rock 1,500,000 tonnes (0.75 tonnes per £1,000 of construction output for a £2 billion project)
- use intensity of total aggregates 2,600,000 tonnes (1.3 tonnes per £1,000 of construction output for a £2 billion project)

9.2.9 The proposed development may absorb up to 2.6 million tonnes of aggregates during the life of the Plan.

9.2.10 In terms of new highway infrastructure over the plan period that has the potential to require significant volumes of aggregates is the Lower Thames Crossing, anticipated to be commenced by 2026 within the anticipated life of the Plan. The cost of the project has been refined since the last LAA, and is now projected at £1.2 to 3.2 billion . Applying the data prepared by BGS the aggregate requirements are as follows:

- use intensity of sand and gravel 750,000 to 1,600,000 tonnes (0.5 tonnes per £1,000 of construction output for a £1.2 to £3.2 billion project)
- use intensity of crushed rock 900,000 to 2,400,000 tonnes (0.75 tonnes per £1,000 of construction output for a £1.2 to £3.2 billion project)
- use intensity of total aggregates 1,560,000 to 4,160,00 tonnes (1.3 tonnes per £1,000 of construction output for a £1.2 to £3.2 billion project)

9.2.11 Given that the Lower Thames Crossing may well have a greater degree of structural concrete work it may be prudent to conclude that it would require more crushed rock than sand and gravel, so requirements will potentially be in the range of 0.9 to 2.4 mt of materials. Though using the 1.3 tonnes per £1,000 of construction output ratio the total aggregate requirements could potentially be in the region of 4.2 million tonnes.

9.2.12 In terms of the anticipated major projects in Kent during the Plan period 2013-30 the total aggregate requirements could well show a variety of ranges, up to a potential maximum of 6.8 million tonnes.

Highways Infrastructure

9.2.13 The total identified highway scheme build for the period 2015-21 in Kent (excluding Medway), has a cost of some £982.5 million, this projection has significantly risen since the last Kent LAA. As stated before the assessment of aggregate use is complex, the programed Kent road construction that would use a wide variety of aggregates, soft sands as well as crushed rock for asphalt coated stone product applications (such as base courses of macadam and wearing courses) sand and gravel use in concrete road structure occurs as well. Road structural sub-bases are generally crushed rock.

9.2.14 Another significant scheme, the proposed dualling of the A21 between Tonbridge to Pembry, was considered by the Secretary of State in May 2014, following an earlier Public Inquiry. It was concluded that the road scheme should proceed, the route chosen (this being the Published Scheme) came at a cost of £104.1 m. Work on the project has commenced and is ongoing (due to be completed Spring 2017). Applying the data prepared by BGS the aggregate requirements for the total identified highway scheme build and A21 dualling in Kent are as follows:

- use intensity of sand and gravel 52,050 tonnes (0.5 tonnes per £1,000 of construction output for a £104.1 mllion project)
- use intensity of crushed rock 78,075 tonnes (0.75 tonnes per £1,000 of construction output for a £104.1 million project)
- use intensity of total aggregates 135,330 tonnes (1.3 tonnes per £1,000 of construction output for a £104.1 million project)

9.2.15 Given the complexity of road construction in terms of the range of potential materials used, it would need to apply the BGS ratio for total aggregates intensity of use for general road construction. In this case this project would require in the range of 135,330 tonnes of aggregates. Other highway schemes are to be anticipated over the life of the plan.

9.2.16 The cost of the Kent general road construction programme, including the A21 dualling (excluding Medway), is estimated at some £1,087 million for the period 2015-21. The overall aggregate consumption using the BGS assumptions is as follows:

- use intensity of sand and gravel 543,500 tonnes (0.5 tonnes per £1,000 of construction output for £1,087 million expenditure)
- use intensity of crushed rock 815,250 tonnes (0.75 tonnes per £1,000 of construction output for £1,087 million expenditure)
- use intensity of total aggregates 1,413,100 tonnes (1.3 tonnes per £1,000 of construction output for £1,087 million expenditure)

9.2.17 Given the different aggregate types that will be employed for highway maintenance works the higher figure of some 1.4 million tonnes required over 2015-21 (within the overall life of the emerging Plan) may be the more reliable, but this is conjecture.

Infrastructure Maintenance

9.2.18 Maintenance spend on Kent's infrastructure is an on-going process year to year. The amount of expenditure for this work during financial year April 2013 – March 2014 was approximately £54 million (internal Kent County Council data). A revision of this figure was not available at the time of writing, therefore the same figure is used here again (though it is anticipated that the figure will be reduced in future as part of local government funding decisions).

9.2.19 Of this figure £6.4 million was for drainage works, £8.5 m was spent on lighting and highway structures at £1.2 million. Therefore, by process of deduction, highway maintenance expenditure of £39 million on matters requiring aggregates in various forms is required each financial year. The highway re-surfacing expenditure for the same period was £5.8 million giving a total of £44.8 million for highway maintenance over the financial year that will require aggregate resources. A range of aggregate types will be required, so it may be reasonable to use the BGS ratio of 1.3 tonnes of aggregate per £1,000 of construction output in calculating the overall required quantities. Giving 58,240 tonnes for the financial year period. How representative of future expenditure per year and thus the associated aggregate use remains uncertain. Over the life of the Kent Minerals and Waste Local Plan 2013-30 (a 17 years period) a total of 9.9 mt of aggregates may be required for Kent's highway infrastructure maintenance.

9.2.1 Conclusions of the Intensity of Aggregate Use in Kent

9.2.1.1 Over the general life of the Kent Waste and Minerals Local Plan 2013-30 (anticipated to be adopted in 2016) and beyond, the following broad aggregate requirements can be predicted in Kent:

- **House Building** - 5,865 new units per annum would require 7.04 million tonnes of aggregate for the period 2013 to 2030, and 6.33 mt between 2015-31.
- **Education Infrastructure** - Educational requirements are estimated to be between up to 0.939 million tonnes between 2014 and 2031.
- **Major Projects** (Lower Thames Crossing and Paramount Park) -The project has a projected range of aggregate requirements up to a maximum of 6.8 mt during the plan period 2013-30.
- **Highways Infrastructure** - The Kent general road construction programme during the plan period would require in the order of 1.40 mt of aggregates between 2015-21.

- **Highways Infrastructure Maintenance** - Currently 0.58 mt are required for each financial year, for the plan period 2013-30 almost 9.9 mt of aggregates may be required. Though it is understood that this is unlikely to be an accurate forecast given the likely changes in Governmental grant for highways maintenance.

9.2.1.2 Therefore, it can be reasonably concluded that between 2015 and 2031 a a potential maximum of 25.34 mt of aggregates of various kinds will be required. The NPPF's online Planning Practice Guidance does not indicate over what time span a forecast of aggregate demand should be made. The life of the anticipated County Council's Plan is an extended forecast, which may well be unrealistic given that the characteristics of the economic cycles may well change in the future compared to those that generated past sales averages data. A 7 year forecast, the same length as that of the maintained landbank for sands and gravels (though 'maintained' means a 7 year landbank being in existence in any one year, a rolling landbank in effect) may be a more realistic time horizon to predict over.

9.2.1.3 Provided the following assumptions on housing supply, highway infrastructure and maintenance, and education are used (the Lower Thames Crossing has been discounted as unlikely to come forward by 2021) the following can be predicted:

- Approximately 5,865 new housing units per annum, totalling 41,055 for 7 years.
- £722.40 million on educational infrastructure, this being new schools and extensions to existing to support new housing, to be delivered 2014-31. For the period of the next 7 years till 2021, the predicted spend, pro rata may be £297.50 million.
- Paramount Park constructed by 2018/19 cost £2 billion.
- Total identified highway scheme build in Kent (excluding Medway), at a cost of £631.40 million for the period 2015-21.
- A21 dualling Tonbridge to Pembury cost £104 million.
- Seven years of highway infrastructure maintenance costs of £4.06 million.

9.2.1.4 Then the required aggregate supply breakdown can be attempted:

1. **House Building** - The application of the assumed 60 tonnes per house consumption means that for the housing sector to build 41,055 units would require 2.46 million tonnes between 2015 and 2022.

2. **Education Infrastructure** - A pro rata prediction of £297.50 million is to be spent on educational requirements, to deliver new and expanded schools. It is considered that if the ratio of approximately 1.3 tonnes of all aggregates per £1,000 of construction output is used an estimated 0.387 million tonnes of all aggregate types will be required between 2015 and 2022.

3. **Major Projects** (Paramount Park) - Given that it is reasonable to assume that the majority of aggregate use would be directed towards crushed rock for concrete manufacture the project may consume approximately 2.6 million tonnes of aggregate materials, based on an intensity of 1.3 tonnes of all aggregate use per £1,000 of construction cost. The Lower Thames Crossing has an anticipated spend of £2 billion and require potentially up to 4.2 million tonnes of aggregates, assuming the project is completed within the next 7 years, this may be too soon a time frame for this project.

4. **Highways Infrastructure** - The Kent general road construction programme including the A21 dualling (excluding Medway) at a cost of £735.40 million is for the period 2015-21. This would require in the order of 0.96 mt of aggregates.

5. **Highways Infrastructure Maintenance** - Currently 0.58 million tonnes are required in any financial year, for the period 2014-21 approximately 4.06 mt of aggregates may be required.

9.2.1.5 The amount of aggregate material, that may be required over the next seven years may well be in the region of 14.7 million tonnes for all aggregates from all the identified sectors of activity above. This 'proxy' for aggregate demand is a model of reality that may have inherent weakness to a greater or a lessor degree, as all models. Comparison to actual recorded aggregate consumption may indicate to what degree these weakness exist. Therefore, when this comparison exercise it done with the 10 year rolling past sales averages (combined for the main landwon aggregate types) and the figure generated by local circumstances as the proxy for aggregate demand there is an does appear to be and insignificant disparity between the two methodologies.

9.2.1.6 Table 20 below demonstrates the results of the two different approaches.

Table 20 Comparison between the 10 Year Rolling Averages and Local Circumstances Estimated Demand Model for 7 Years 2015-2022

All Aggregates Combined	Demand based on the 10 Year rolling average sales figure for 7 years (A)	Local Circumstances Demand Estimate (B)	Percentage of (A) of (B) or the degree to which the local circumstances prediction match past sales based predictions
Overall totals of Aggregate Demand	Soft Sands **4.27 mt** Sharp Sands and Gravel **4.9 mt** Hard Rock **5.46 mt** Overall Aggregate Total Requirement **14.63 mt**	Overall Aggregate Total Requirement **14.67 mt**	0.27% variation between methodologies

9.2.1.7 The local circumstances modelled demand in the second Kent LAA is only some 0.27% in variation from that of the 10 year average sales derived data for all types of aggregates combined in Kent, for the 7 year period 2015-22. Essentially the two approaches are giving the same result. However, the local demand model assumes the completion of the Lower Thames Crossing before 2022. This is considered unlikely.

9.2.1.8 The local demand model methodology may well still be of limited utility by reason of the un-captured construction activities of the general community and small to medium construction firms are also consuming aggregates from retail and trade outlets. These were not taken into account in the model due to a lack of readily available data. It may well be the case that the average past sales derived data does indeed accurately reflect the un-modelled element of local demand that exerting a demand.

10 Future Aggregate Supply Options in Kent to Maintain a Steady Supply of Aggregates to Meet Market Needs in Kent

10.0.1 The securing of new mineral reserves in the future to maintain a steady and sustainable supply is an important role of the County Council. The authority has initiated the process of identifying sites where potentially economically important minerals may be extracted in an environmentally acceptably manner. The sites were initially identified by a 'Call for Sites' exercise in 2010 and 2011, where landowners or their agents and operators came forward with potential sites for mineral extraction, processing and importation of a range of aggregates including soft sand, sharp sand and gravel and crushed rock (including secondary and recycled aggregates). These sites were considered for inclusion in a Kent Mineral Sites Plan. A series of public consultations culminated in May 2012 with a Mineral Sites Preferred Options consultation. The preferred options for consideration were selected to provide the necessary provision for each type of aggregate mineral in Kent to the end of 2030. This being based on planning policy requirements and the estimated levels of supply and demand in the County for this period. The document set out the 'preferred options' with a summary of the site proposal, site characteristics, key planning issues and the Strategic Environmental Assessment (SEA).

10.0.2 With regard to the landwon soft sand landbank the calculations in section 8.2.1 demonstrate that reserves though extensive are finite and a maintained NPPF compliant landbank will not last until 2030, indeed the landbank will fall below 4.27 mt of permitted reserves by 2019/20. Several further soft sand sites were proposed by operators for consideration as part of the Mineral Sites Plan's 'Call for Sites', they were:

- Land Adjacent to Platt Industrial Estate, Tonbridge and Malling, estimated resource of 1.35 mt
- Land north of Addington Lane, Tonbridge and Malling, estimated resource 0.472 mt[(15)]
- Chapel Farm, Maidstone, estimated of resource 3.5 mt
- Burleigh Farm and Tile Lodge, Charing, Ashford, estimated of resource 2.7 mt
- Shrine Farm, Postling, Shepway, estimated of resource 8.0 mt
- Borough Green Sandpit Extension, Wrotham, Tonbridge and Malling, estimated resource 0.4 mt

15 In November 2014 an application was submitted to Kent County Council for the extraction of 0.496 mt of soft sands (aggregate) and 0.968 mt of silica sands at the site. The application was determined on the 11th September 2015 and will become part of the recorded soft sand reserves in Kent's LAA for 2015

10.0.3 The total potential new reserves amount to an estimated 16.422 mt. If these reserves were come forward they would enable a maintained 7 year landbank to be perpetuated past 2030. The potential future replenishment of the soft sands landbank in Kent does not appear to be at the point where a steady and sustainable supply of this aggregate type would be constrained by a lack of resources. Table 21 below shows the current permitted soft sands landbank with replenishing reserves identified and modelled as coming on stream at the beginning of the plan period, with the effect of the yearly draw down from extraction, based on the 10 year average sales figure.

Table 21 Landbank Calculations for Landwon Soft Sands with Preferred Sites Options Included

Year	Permitted Reserves with additional Preferred Options Reserves modelled together as available reserves mt	10 Year Sales Average Draw Down Figure 0.61 mt	Remaining Reserves End of Year mt	Cumulative Further Reserve Requirements for a maintained 7 year Landbank of at least 4.207 mt
2014	24.462	0.601	23.86	0
2020 (plus 7 years on)	20.856	0.601	20.255	0
2030 (end of Plan period)	14.846	0.601	14.254	0

10.0.4 By the end of the anticipated emerging Plan period there would be some 14.254 mt of soft sands remaining. The replenishing resources would ensure an NPPF compliant maintained landbank over the Plan period and at 2030 there would be more than an additional 7 years landbank of reserves available. Though, of course this model assumes that all the identified replenishing reserves come forward early in the Plan period, which may not be realistic. If the last three years sales average is used to assess how long the NPPF compliant 7 year maintained landbank would last it can be reasonably concluded that the permitted reserves together with the potential replenishing reserves would last considerably longer. The three year sales average is some 0.385 mt rather than the 0.601 mt of the ten year average. Again, it can be concluded that the County's soft sand reserves into the future (permitted and anticipated replenishment new reserves) will very probably ensure a steady supply to meet market needs.

10.0.5 The future supply situation with regard to the sharp sands and gravels is a marked under supply of permitted reserves to meet the 7 year maintained landbank requirement. The sharp sand and gravel land bank calculations in section 8.1.4 to 8.1.5 and Table 16 demonstrate that a marked under supply currently exists. A 7 year landbank is not being provided at this time.

10.0.6 The County's sources for high quality flint gravels are geologically concentrated in areas where flints derived from the Chalk have been deposited by river and marine action as the northerly Pleistocene Ice Age ice sheet retreated and sea levels rose. The deposits are found predominantly in the three main river valleys of the Darent, Medway and Stour, and the beach deposits along the coast, (particularly at Dungeness a cuspate foreland formed by long shore drift of storm beach deposits).

10.0.7 During the 1970s planning studies for the Kent Structure Plan 1975 identified the lack of alternatives to the flint gravels as a critical issue. Flint gravel resources in the river valleys were becoming exhausted and increasing weight has been accorded to nature conservation and water resource constraints in the Dungeness area. In the past this beach deposit has provided an area of extensive working and substantial reserves, this is no longer the case given that the significant remaining areas are covered by environmental constraints. Flint dominant head gravel resources near Herne Bay, previously identified as plan proposals (Kent Minerals Plan 1993) have been proven to be of a limited nature and have effectively been abandoned by the industry.

10.0.8 The sandstone dominant gravels in the Medway Valley upstream of Maidstone became the subject of increasing interest from operators as other deposits became worked out, although their contribution to the production of high quality concreting aggregates has not normally been possible unless blended with other aggregates first. One site extracting this material remains operational at this time at East Peckham. The site has the benefit of a railhead connection allowing for the importation of crushed rock. This can be blended with the indigenous sandstone gravels to produce aggregates suitable for concrete production.

10.0.9 Several sharp sand and gravel sites were proposed by operators, landowners and their agents for consideration during the 'Call for Sites' exercise. A number of sites were not allocated as Preferred Options in this document for a number of reasons, including of site operational difficulties, limited resources and environmental constraints. They include the following rejected sites:

- Arnolds Lodge Farm West, East Peckham, Tonbridge and Malling, estimated resource 200,000 tonnes
- Woodfall's Farm, Yalding, Maidstone, estimated resource 1,500,000 tonnes
- Filston Lane, Shoreham, Sevenoaks, estimated resource 600,000 tonnes

- Ham Farm, Faversham, Swale, estimated resource 1 million tonnes
- Lydd Quarry, Allens Bank Quarry extension, Lydd, Shepway, estimated resource 0.3 million tonnes

10.0.10 The sites are shown in Appendix B in more detail as site plans, the nature of the potential reserves and the reasons for exclusion. The total loss of potential reserves due to limited economic viability, operational difficulties and environmental constraints amount to an estimated 6.45 mt.

10.0.11 In contrast those sites that have been identified as having the potential to replenish the sharp sand and gravel land-bank during the plan period 2013-30 are detailed in the same document. They are:

- Beltring Green Farm, East Peckham estimated resource of 300,000 tonnes.
- Moat Farm, Capel estimated resource of 1.5 mt.
- Land North and South of Hammer Dyke, Capel estimated resource of between 1 to 3 mt.
- Stoncastle farm Quarry, (Western Extension), Whetsted estimated resource of 1.07 mt.
- Lydd Quarry Extensions: Areas A-D, Lydd estimated resource of 1.6 mt.

10.0.12 Additional permitted reserves of between 5.47-7.47 mt could potentially come from these sites, which are identified as acceptable preferred options during the Plan period (this exercise identifying preferred options is to be revisited prior to the allocation of sites given the lapse in time since the preferred options document was published for consultation). The potential sharp sands and gravel landbank calculation is shown in Table 22 below.

Table 22 Sharp Sands and Gravel Landbank in Kent Current Reserves Plus Potential New Reserves

Year	Permitted Reserves with additional Preferred Options Reserves Modelled together as available Reserves mt	10 Year Sales Average Draw Down Figure 0.70mt	Remaining Reserves End of Year mt	Cumulative Further Reserve Requirements required to maintain a 7 year Landbank of at least 4.90 mt
2015	8.11 to 10.11 mt	0.70 mt	7.41 to 9.41 mt	0
2020 (plus 7 years on)	3.91 to 5.91 mt	0.70 mt	3.21 to 5.21 mt	1.69 to 0 mt [1]
2030 (end of Plan period)	-3.79 to -1.79 mt	0.7 mt	-4.49 to -2.49 mt	9.39 to 7.39 mt

1. (no further new reserves requirement for the higher estimated replenishment reserves base)

10.0.13 Clearly even if early on in the plan period the total potential resources identified as the preferred option sites were to be secured, as permitted new reserves, this still would be insufficient to ensure a maintained landbank of sharp sands and gravel throughout the life of the anticipated Plan 2013-30 (this is illustrated by Table 32 in Appendix D in more detail). In the above scenario even with the maximum replenishment of the sharp sands landbank occurring at the beginning of the Plan period (7.47 mt) by 2020 more reserves are required and by 2030 7.39 mt would have been required to maintain a 7 year landbank, factoring in an additional 7 years reserves as required to be remaining in the landbank at the end of the Plan period, overall new reserves that would need to be permitted over the Plan is 12.29 mt.

10.0.14 As in common with all modelled scenarios, the underlying assumptions can be unrealistic. The above scenarios are all predicated by a 10 year average of the recorded sales figures. Government guidance allows for 'other relevant local information', including the last 3 years sales averages, if they demonstrate any marked change in the pattern of supply.

10.0.15 Further analysis of more recent sales averages shows a corresponding lowering of the average quantities for the sands and gravels sales of both types. This has the effect of a lower draw down figure (based on an average of sales for the last 3 years). The sharp sands and gravels last three year sales average is 0.42 mt, Table 23 below shows how this would increase the period of a maintained 7 year NPPF compliant landbank.

Table 23 Sharp Sands and Gravel Landbank in Kent Current Reserves Plus Potential New Reserves

Year	Permitted Reserves with additional Preferred Options Reserves Modelled together as available Reserves mt	3 Year Sales Average Draw Down Figure 0.42mt	Remaining Reserves End of Year mt	Cumulative Further Reserve Requirements required to maintain a 7 year Landbank of at least 2.94 mt[1]
2015	8.11 to 10.11 mt	0.42 mt	7.69 to 9.69 mt	0
2020 (plus 7 years on)	6.01 to 8.01 mt	0.42 mt	5.59 to 7.59 mt	0
2030 (end of Plan period)	1.81 to 3.81 mt	0.42 mt	1.39 to 3.39 mt	1.55 to 0 mt [2]

1. revised figure based on last three years sales data
2. (no further new reserves requirement for the higher estimated replenishment reserves base)

10.0.16 When applying the three year average sales draw down figure the sharp sands and gravels reserves (permitted and those anticipated as replenishment reserves) of a potential 10.11 mt would enable a 7 year maintained landbank to be in existence at the end of the anticipated Plan period of 2030. Though an additional 7 years post 2030 would require another 1.39 mt of reserves that are not identifiable as potentially acceptable through the Preferred Option consultation exercise. It can be concluded that even if the recent lowered sales experienced by this sector in overall aggregate supply continues the sharp sands and gravel resource in Kent will not meet national Planning Policy requirements post 2030.

10.0.17 Hard rock supply, in terms of permitted reserves, is abundant and poses no real difficulties for supply for a significant time span. Though a NPPF compliant maintained landbank would require a 7.8 million tonne landbank being maintained, this is would necessitate further reserves being released post 2022. This cannot be adjusted using a last three year average of hard rock sales given the confidentiality issue that negates any other sales average figure being used other than the 0.78 mtpa figure agreed between the the County Council and the AWP.

11 Conclusion

11.0.1 Kent's third LAA will help determine if there are any particular 'local circumstances' where it can be considered that the use of the ten year average sales based forward prediction methodology should be potentially supplanted by a more local circumstances approach (see Section 9).The results of this modelling exercise were found to be not significantly different (less than 1%) than the averaged last ten years sales based computations. However, this included modelling for the Lower Thames Crossing occurring within the next 7 years; this may well be unrealistic and this lack of realism may be compounded by the model not capturing aggregate usage at the more local scale. Therefore, use of the 10 year average based prediction still represents a more realistic methodology.

11.0.2 Recent reductions in sales prompted an analysis of the last three year average sales data on reserve life and those reasonably anticipated replenishing reserves. However, it could be the case that this average was less reliable, given the depressing effect of the recent economic recession particularly during 2008-09 which may still be having an impact. Although more certainly the fact that Kent has recently had sales transferred to East Sussex at Scotney Court Quarry in Lydd (extraction moved across the respective county border in 2013) has significantly reduced Kent's overall landwon output. Without commensurate new reserves coming on stream to replace this output, continued reduction in overall sales is anticipated to continue.

11.0.3 Applying the ten year past sales methodology demonstrated that the elements of the existing landbank reserves were insufficient to meet the projected needs of the emerging Plan and remain NPPF compliant. This was particularly the case for sharp sands and gravels and to a lesser degree the soft sands, while there was an abundance of hard rock reserves that more than meets NPPF requirements. Examining each in turn again (in 2015) showed the following circumstances in Kent's landwon aggregate supply base:

- the soft sands permitted landbank, at the end of 2014 was 8.04 mt. This would maintain a 7 year landbank of at least 4.207 mt of permitted reserves in any one year, with an extraction rate equal to the 10 year average sales figure of 0.601 mt, until 2019/20, some 9-10 years before the end of the Plan period.

- the sharp sands and gravel landbank, at the end of 2014 was 2.64 mt. This does not give a simple 7 year landbank for Kent at this time (of at least 4.9mt). Given the current permitted reserves of only 2.64 mt an additional 2.26 mt is required to give the simple 7 year landbank, and this would be depleted at an anticipated rate of 0.70 mtpa based on the last 10 year sales averages. To maintain a 7 year landbank NPPF compliant maintained landbank would require significant amount of new permitted reserves to come forward. Those that are identified in the Kent Minerals and Waste Local Plan Preferred Options Consultation (May

2012) sites, at the maximum resource estimation, would provide for a maintained landbank until 2021-22 only, some 7-8 years short of the end of the Plan period of 2030.

- the hard rock permitted landbank at the end of 2014 was in the order of 48 mt. This would maintain a 10 year landbank of 7.8 mt (or more) of permitted reserves in any one year, with an extraction rate equal to the proxy for the 10 year average sales figure (0.78 mt) beyond 2030. The reserves, when considered as a simple landbank would last into the 2070's with the accepted proxy draw down rate of 0.78 mtpa. An NPPF compliant landbank where 7.8 million tonnes are maintained over the period of the Plan can readily be maintained.

11.0.4 The NPPF requires MPAs to calculate and maintain separate landbanks for any aggregate materials of a specific type or quality which have a distinct and separate market. The more recent DCLG guidance on MASS reiterates this, with some added flexibility on this subject, stating that:

11.0.5 *"Where there is a distinct market for a specific type or quality of aggregate such as high specification rock, asphalting sand, building sand or concreting sand, a separate landbank based on provision to that market may be justified for that material or those materials".* In respect of Kent's landwon aggregates these relate to hard rock, soft sand and the sharp sands and gravels:

- The evidence within this third LAA shows that in Kent there is abundant reserves of crushed rock that will meet the requirements of the market for a considerable period (into the 2070s), a maintained NPPF compliant landbank can be expected to last well beyond 2030. The Kent Minerals and Waste Local Plan Preferred Options Consultation document does not identify new potential reserves in any detail, although it mentions the operator's proposed westerly extension to Hermitage Quarry and the deep limestone mining potential around Richborough. The extension to Hermitage Quarry was permitted in 2013, and there has been no indication that mining of limestone is attractive to the quarrying industry at this time and the area was not identified in the document. However, this does not preclude this, or other areas in Kent, coming forward in the future with additional proposals for new reserves though at this time there are no indications that this is likely and would not be necessary to meet the NPPF requirements.

- The existing soft sands reserves in Kent are considerable and serve a distinct market as an aggregate for mortar and asphalt production. A 7 year landbank exists in the County at this time. With additional reserves coming on stream that may be sustainably extracted there should be sufficient material to meet

the maintained landbank requirement of the NPPF well past 2030. The potential for interchangeability between silica and soft sands at the currently permitted reserves sites is not occurring and the permitted landbank data appears accurate.

- The same is not the case with Kent's land-won sharp sands and gravels. This is a rapidly depleting resource as the existing permitted reserves and the potential new sustainable and deliverable reserve replenishments are somewhat limited. If they were to come forward, in a timely fashion, the latter could meet the NPPF requirement of a maintained 7 year landbank for sharp sands and gravel until 2018-19. While the Plan period is until 2030, it is recognised that the sharp sands and gravels in Kent are in marked decline as a landwon resource; this is as a consequence of their more limited geological occurrence. It is also the case that they are located in increasingly constrained areas of the county (Dungeness being a prime example of a highly sensitive protected landscape with internationally and nationally recognised biodiversity interests) to realistically deliver new reserves to maintain a 7 year landbank based on the last 10 years sales averages for any significant period.

11.0.6 The Examination into the Kent and Minerals Local Plan 2013-30 considered the resource implications of the second Kent LAA assessment of reserves, thus identifying the shortfall and surplus relationships of the soft and sharp sands and gravels with current reserve base at this time (2015). The imperative was to identify if the available reserves and those that can reasonably be anticipated would meet the market needs over the Plan's life. Table 24 shows that the then current reserves were not enough to support market demand over the Plan period.

Table 24 Overall Landbanks for Sands and Gravel and the Shortfall and Surplus Projections Over the Life of the Plan (KMWLP Examination data)

Mineral Types	Plan Period Requirements 17 Years	7 Year landbank requirements at end of Plan	Total Requirement	Permitted Reserves	Total Shortfall or Surplus
Soft Sand	17 x 0.65=11.05 mt	4.55 mt	**15.60 mt**	14.44 mt	**1.16 mt shortfall**
Sharp Sand and Gravel	17 x 0.78=13.26 mt	5.56 mt	**18.82 mt**	3.61 mt	**15.21 mt shortfall**
Total	24.52 mt	10.11 mt	**34.42 mt**	18.05 mt	**16.37 mt shortfall**

11.0.7 When the potential reserves from the Kent Minerals and Waste Local Plan Preferred Options Consultation sites were factored in, there would be a surplus at the end of the Plan period, though only if the landbank for both types of sands and gravels were in the non-NPPF compliant combined landbank form. This was not considered an acceptable way to ensure conformity to National Planning Policy and during the Examination, the soft and sharp sands and gravels were disaggregated. Table 25 below shows these calculations in tabular form. The soft sands are in surplus at the end of the Plan period, when calculated independently from the sharp sand and gravel resources and including the potential new permitted replenishing reserves. The same cannot be stated for the sharp sands and gravels. In this latter case there would remain a significant shortfall against NPPF requirements for the County's sharp sand and gravel landwon supply to meet anticipated needs.

Table 25 Overall Landbanks for Sands and Gravel and the Shortfall Projections Over the Life of the Plan (KMWLP Examination data)

Mineral Types	Plan Period Requirements 17 Years	7 Year landbank requirements at end of Plan	Total Requirements	Permitted[1] Reserves	Preferred Sites Reserves	Total Reserves	Total Shortfall or Surplus
Soft Sand	17 x 0.65=11.05 mt	4.55 mt	**15.60 mt**	14.44 mt	16.42 mt	30.86 mt	**15.26 mt surplus**
Sharp Sand and Gravel	17 x 0.78=13.26 mt	5.46 mt	**18.72 mt**	3.61 mt	7.47 mt	11.08 mt	**7.64 mt shortfall**
Total	24.31 mt	10.01 mt	**34.32 mt**	18.05 mt	23.89 mt	41.94 mt	**7.62 mt surplus**

1. The soft sand reserves include 4 mt included at Aylesford Sand Pit at this time

11.0.8 The current position, as of late 2015, with the revised 10 year sales averages data, is shown on Table 26 below, again in tabular form.

Table 26 Overall Landbanks for Sands and Gravel and the Shortfall Projections Over the Life of the Plan

Mineral Types	Plan Period Requirements 17 Years	7 Year landbank requirements at end of Plan	Total Requirements	Permitted Reserves(1)	Preferred Sites Reserves	Total Reserves	Total shortfall or Surplus
Soft Sand	17 x 0.601= 10.22mt	4.207 mt	**14.42 mt**	8.04 mt	16.42 mt	24.46 mt	**10.04 mt surplus**
Sharp Sand and Gravel	17 x 0.70= 11.90mt	4.90mt	**18.72 mt**	2.64 mt	7.47 mt	10.11 mt	**8.61 mt shortfall**

1. the 4 mt of reserves at Aylesford Quarry has been subtracted from total reserves given findings at the Plan's Examination that they are industrial in type.

11.0.9 As part of the Kent Minerals and Waste Local Plan 2013-30 examination in 2015, the Plan has been modified from the Submission Version in that the combined soft and sharp sands and gravel that were treated as one landbank are now to be treated as separate landbanks. Table 26 above demonstrates that the Kent County Council area has an inability to meet market demands over the emerging Plan period for the sharp sands and gravels.

11.0.10 Policy CSM 2 of the emerging Plan recognises this, and at the Plan's Examination Hearing it was agreed that an alternative strategy to meet this shortfall would be appropriate. Thus in the future, Kent will increasingly have to rely on substitute secondary and recycled aggregate and marine dredged imports to ensure the market needs met by this aggregate type continue. This appears to be occurring at this time, imports showed a 13% increase in 2014 compared to 2013, and are at 2.9 mt as of 2014. While data for the secondary and recycled materials used to produce secondary aggregates for 2014 are not yet available, it is anticipated that they will be at least similar to the 2013 figure of 0.8 mtpa. It appears reasonable to expect this level of alternative utilisation of materials (some 3.7 mtpa) other than landwon materials will continue and increase. Particularly as importation capacity is currently under-utilised. The permitted capacity of Kent's wharfs is in the order of 8 mtpa (estimated) (see paragraphs 4.3.5 to 4.3.7), though this capacity is not evenly distributed across the available sites and is only a theoretical maximum.

11.0.11 Practical considerations of wharf operation are complex and different locations will have different constraints on such matters as ship size, depth of available mooring water, operational hours and proximity to all of Kent's markets etc. It can however be concluded that the depletion in the landwon resource of sharp sands

and gravels can only be offset by the combination from imports and secondary and recycled aggregate materials. This underlines the importance of the retention of importation infrastructure in Kent.

11.0.12 The NPPF requires the LAA to assess the balance between demand and supply, local circumstances that effect these factors and how any deficits are to be addressed. This LAA considers this and the emerging policy in the Kent Minerals and Waste Plan 2013-30 (as modified) provides a framework to address the shortfall in supply of the sharp sands and gravels over the life of the Plan in a sustainable manner. The NPPF requires all LAAs in the South East Region to be submitted to the South East Aggregate Working Party (SEEAWP) for ratification. This ensures that Mineral Planning Authorities, such as Kent co-operate on strategic and regional aggregate minerals plans and can respond to Government on national monitoring of supply. The draft Kent LAA was considered by SEEAWP at its meeting in November 2015. It resolved to agree the third Kent LAA, and recognised that the South East Region would depend increasingly on alternatives to local extraction and stressed the need to safeguard appropriate infrastructure.

Appendix A: Permitted Aggregate Quarries Forming the Kent Land-won Landbank

The most up to date list of aggregate quarries in Kent is given in the SEEAWP 13/10 (November 2013) report, this currently remains the case . The list below in Table 29 is taken from that document and updated, italics signify inactive sites.

Table 27 Active and Inactive Sand and Gravel and Ragstone Quarries in Kent

Quarry	Operator	Aggregate Type
Borough Green Sand Pits	Borough Green Sand Pits Ltd	Soft Sand
Charing Quarry	Brett Aggregates Ltd	Soft Sand
Faversham Quarry	Brett Aggregates Ltd	Sand and Gravel
Highstead Quarry	*Brett Aggregates Ltd*	*Sand and Gravel*
Lydd Quarry (Scotney Court Farm)	Brett Aggregates Ltd	Sand and Gravel (extraction moved into East Sussex plant site remains in Kent)
Greatness Farm (Sevenoaks Quarry)	Tarmac Ltd	Soft Sand
Sheperd's Farm Quarry	Brett Aggregates Ltd	Sand and Gravel
Wrotham Quarry (Addington Sand Pit)	Hanson Aggregates	Soft Sands and Silica Sands
Denge Quarry	CEMEX UK	Sand and Gravel
Sqeurreys Sand Pit, Westerham (no reserves post 2013)	*Monier*	*Sand and Gravel*
Igtham Sand Pit	H&H Celcon Ltd	Soft Sand
Darenth and Joyce Green, Dartford	J Clubb Ltd	Sand and Gravel
East Peckham Quarry	J Clubb Ltd	Sand and Gravel
Nepicar Sand Quarry	J Clubb Ltd	Soft Sand
Hermitage Quarry, Maidstone	Gallagher Aggregates	Crushed Rock Ragstone
Blaise Farm, West Malling	Hanson Aggregates	Crushed Rock Ragstone

Quarry	Operator	Aggregate Type
Allens Bank	*Brett Aggregates Ltd*	*Sand and Gravel*
Conningbrook Quarry, Ashford	*Brett Aggregates Ltd*	*Sand and Gravel*
Aylesford Quarry, Aylesford	*CEMEX UK*	*Soft Sands (limited) and Silica Sands 9significant inactive reserves)*
Joyce Green Quarry	*Hanson (Joyce Green Aggregates)*	*Soft Sand and Sand and Gravel*
Stone Castle Farm, nr Tonbridge	*Lafarge Aggregates*	*Sand and Gravel*
Ham Hill Sand Pit (Snodland Quarry)	*Tarmac Ltd*	*Soft Sand*

Appendix B: Kent Minerals Sites Plans - Preferred Options Sharp Sands and Gravel Sites

Potential sands and gravel sites put forward for the Kent Minerals and Waste Development Framework, Mineral Sites Plan, Preferred Options Consultation, May 2012. Together with the environmental constraints and other material considerations that led to their rejection at that time.

Table 28 : Sharp Sands and Gravel sites put forward for the Kent Minerals and Waste Development Framework, Mineral Sites Plan, Preferred Options Consultation, May 2012

Site Name	Estimated Reserves (tonnes)	Notes
Arnolds Lodge Farm West, East Peckham	200,000	Withdrawn by operator
Woodfall's Farm, Yalding	1,500,000	Withdrawn by operator
Filston Lane, Shoreham	600,000	Within Kent Downs ANOB and Green Belt and poor access to highway network. Exceptional circumstances test unlikely to be met.
Ham Farm, Faversham	Unknown	Withdrawn by operators as uneconomic
Hollowshore, Faversham	1,150,000	Part of Swale Estuary and Marshes SPA/Ramsar site. Inclusion would not meet the requirements of the Conservation of habitats and Species Regulations 2010.
Allens Bank Quarry Extension	300,000	Operational requirements of the main non-operational quarry would unlikely to be afforded by this modest extension, quarrying would impact upon known extensive important archaeological remains of Roman and Medieval origin.
	3.75 mt in total	

Appendix C: Statement of Common Ground Between Essex County Council and Kent County Council

Statement of Common Ground between Essex County Council and Kent County Council

Date 4/7/2013 No changes in 2014

1. Introduction

1.1 This Statement of Common Ground sets out the agreed position of Essex County Council and Kent County Council in relation to the Essex Replacement Minerals Local Plan - Submission document, the emerging Kent Minerals and Waste Local Plan (and associated documents) as well as future Duty to Co-operate arrangements.

1.2 While 2009 British Geological Survey data highlights that Essex receives less than 1% of its sand and gravel requirements from the minerals planning area of Kent, and no crushed rock imports, it has been considered that our close proximity necessitates a Statement of Common Ground between the two parties.

2 General Matters

2.1 Essex County Council is a Minerals Planning Authority and is responsible for the production of the Essex Replacement Minerals Local Plan. This is currently under preparation and will guide all mineral related developments arising in the county. The extant minerals plan covering the minerals planning-area of Essex is the Essex Minerals Local Plan 1st Review 1996. The extant plan extends to cover the unitary authority of Thurrock but not Southend-on-Sea. The Replacement Minerals Local Plan does not cover the unitary authorities of Thurrock or Southend-on-Sea.

2.2 Kent County Council is also a Minerals Planning Authority. The minerals planning area of Kent is immediately adjacent to the south of Essex. Kent County Council is responsible for the production and monitoring of its own Minerals Local Plan. Due to the transitional arrangements of the Planning and Compulsory Purchase Act 2004, not all of the policies contained in the latest adopted Kent Minerals Local Plans are still in force. Policies have instead been saved from the Kent Mineral Subject Plan: Brickearth (1986), the Kent Minerals Local Plan: Construction Aggregates (1993) and the Kent Minerals Local Plan: Chalk and Clay and Oil and Gas extraction (1997).

2.3 Essex County Council and Kent County Council are members of the East of England Aggregates Working Party and South East England Aggregates Working Party respectively and send a delegate to all meetings.

3. Evidence Base

3.1 The following documents are agreed by both parties as being robust and fully applicable:

- The Greater Essex Local Aggregates Assessment October 2012 (draft)
- The First Kent Local Aggregates Assessment Dec 2012

4. Common Ground between Parties

4.1 Both parties agree that the emerging Essex Replacement Minerals Local Plan and the emerging Kent Minerals and Waste Local Plan present a compatible basis for minerals planning in the respective mineral planning areas.

4.2 Essex County-Council, through the Replacement Minerals Local Plan, is intending to maintain the provision of sand and gravel in their plan area at the rate of apportionment calculated through the DCLG National and Local Guidelines for Aggregate Provision in England 2005-2020, published in June 2009[(16)]. The emerging Kent Minerals and Waste Local Plan makes provision for a sand and gravel supply based on an average of ten year rolling sales data. This will in effect reduce the amount of sand and gravel supplied from the minerals planning area of Kent from 1.63mpta, as set out in the South England Regional Spatial Strategy 2009 to 1.6mtpa.

4.3 Essex County Council has based plan provision on the basis of the agreed apportionments previously set out in the now revoked East of England Regional Spatial Strategy (draft 2010) as it provides greater certainty to both plan makers and the minerals industry, whilst also providing the flexibility to adapt to changing demands by allowing for a measure of flexibility and contingency. The adoption of a plan provision based on a rolling average of ten year sales by Kent County Council is still considered to allow for compatibility between the two mineral plans. The difference in Kent County Council Plan's provision which arises between the two calculation methodologies is relatively minor, and the amount of indigenous mineral movements between Essex and Kent are also relatively minor.

4.4 The Essex minerals plan area has a higher number of Preferred Sites in the north of the county due to the lack of suitable sites submitted for consideration for extraction in the south, this being a result of the absence of economically viable deposits in south Essex. The Kent minerals planning area has an absence of preferred options for future land won aggregate supplies in the north of the county. Whilst there could therefore be issues with regard to mineral supply in these respective areas there are a number of wharves in the north of Kent and the adjoining authority of Thurrock which can act as 'virtual quarries'. It is considered that the north of Kent and the south of Essex can, in part, be potentially supplied with mineral imported by these wharves.

4.5 Essex County Council and Kent County Council mineral planning officers recognise that there will be cross-boundary movements of minerals between Essex and Kent. There is the understanding that any revision of mineral provision in the future may have implications for our respective authorities.

16 1 and as further apportioned in the draft East of England Regional Spatial Strategy 2010 as Policy M1

5. Terms of Future Duty to Co-operate Meetings

5.1 Both parties agree that to fulfil the terms of the Duty to Co-operate, there will be the requirement for planning policy officers of Essex County Council and Kent County Council to continue discussions on a periodic basis. In particular these discussions are required to understand better the cross-boundary movements of aggregate to ensure demand is met a managed way. Further, whilst being adjoining authorities, Essex County Council and Kent County Council are members of different Aggregate Working Parties and will therefore endeavour to meet together on a one to one basis. With the removal of the Regional tier of planning it will be helpful if the two authorities continue to forge closer links. As a minimum it is currently envisaged that a meeting will take place on an annual basis although, as each authority reaches different stages in plan preparation and review, or due to future changes in planning legislation, there may be call for further liaison above this annual commitment.

6. Terms of Agreement

6.1 This agreement is made without prejudice to the outcome of any future work or discussions that may be held between Essex County Council, Kent County Council, or other parties.

Appendix D: Aggregate Landbank Calculation Tables by Year

D.1 Calculation details of aggregate resources.

Table 29 Capacity of Recycled/Secondary Aggregate Production in Kent February to March 2013 Quantities in unless otherwise stated overall Production in the region of 1.245 mtpa (1)

District and Locality	A	B	C	D	E	F	G	H
Ashford								
Conningbrook Quarry	LD	LD	0.75 mt	40,000	No			#
Sevington	LD	LD	LD	0	No	#		
Hothfield	LD	LD		10,000	No	#		#
Canterbury								
Shelford Landfill	490	LD		25,000	No			#
Dartford								
Old Rochester Road	800	0.24 mt		0.24 mt	No	#		
Pinden Quarry	LD	LD		0.77 mt	Yes		# Active consent until 2042	
Swanscombe	LD	LD	0.05 mt	0	Yes			
Dover								
Richborough Hall	LD	LD		0.102 mt	No			

District and Locality	A	B	C	D	E	F	G	H
Pike Road	LD	LD		10,000	No			
Maidstone								
Allington Quarry	LD	0.50 mt	0.50 mt	0.60 mt	No	#		
Thanet								
Ramesgate New Port	LD	0		0	No	#		
Stonelees	LD	LD		0	No			#
Tonbridge and Malling								
Hermitage Quarry	LD	LD	0.585 mt	0.53 mt	No		# Until reserves exhaust	
Platt Quarry	LD	LD		8,000	No			
Borough Green Landfill	LD	LD		0	No			#
East Peckham	LD	LD		LD	No			#
Ham Hill	LD	LD		LD	No	#		
Swale								
Faversham Quarry	LD	0.175 mt	0.175 mt	9,600	No		# Until reserves exhaust	
Ridham Dock	LD	10,000		60,000	No	#		

District and Locality	A	B	C	D	E	F	G	H
Ridham Dock Road	LD	LD		0	No	No longer operational		
Ridham Dock Complex	LD	0.50 mt	LD	LD	no	#		
Unit 34 Queenborough	LD	0.150 mt	0.10 mt	70,000	Yes	#		
Sevenoaks								
Greatness Quarry	LD	LD		3,000	No		# Until restoration completed	
Totals		1.215 mt^ plus	1.135 mt^ plus	1.245 mt^		9*	4*	6*

1. LD denotes lack of production data from operator, * indicates the actual number of sites and ^ indicates the overall tonnages A=Daily Productive Capacity, B=Annual Productive Capacity, C=EA Licence, D=Recorded Actual Production 2012 , E= Off-site Capability, F=Permanent Facility , G=Semi-permanent Facility, H=Temporary Facility the # denotes the existence of such facility falling within any of the categories A to H

Table 30 Kent Landwon Combined Soft and Sharp sand and Gravel Sales 2004-13 (excluding Hoggin and bulk fill aggregate sales)

Year	Tonnes
2005	1,712,000
2006	1,372,789
2007	1,759,369
2008	1,582,798
2009	1,963,120
2010	1,385,497

Year	Tonnes
2011	1,058,764
2012	1,040,031
2013	756,000
2014	564,699
Total sales	13,195,067
Average sales 2012-14 (3 years)	786,910
Average sales 2010-14 (5 years)	960,998
Average sales 2005-14 (10 years)	1,319,507 (1.32 mt)

Table 31 :Kent Landwon Soft Sand Sales 2004-13

Year	Soft Sands Sales
2005	541,000
2006	612,215
2007	681,012
2008	755,590
2009	1,199,120
2010	621,573
2011	438,909
2012	387,746
2013	483,000
2014	289,087
Total Sales	6,009,252
Average sales 2013-14 (3 years)	385,511
Average sales 2010-14 (5 years)	444,063
Average sales 2005-14 (10 years)	600,925 (0.601 mt)

Table 32 Landbank Calculations for Landwon Sharp Sands and Gravels for Permitted Reserves (as of 2014) and a Potential Total of 7.47 mt of New Reserves Secured (the maximum potential new reserves from the Preferred Options Consultation Sites)

Year	Permitted Reserves at Start of Year 2.64 mt with additional reserves of 7.47 mt secured giving a total of 10.11 mt as end of 2013 and beginning of 2014	Draw Down During Year as per the 10 Year Sales Average per year (0.70 mt)	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 4.90 mt
2014	10.11	0.70	9.41	0
2015	9.41	0.70	8.71	0
2016	8.71	0.70	8.01	0
2017	8.01	0.70	7.31	0
2018	7.31	0.70	6.61	0
2019	6.61	0.70	5.91	0
2020	5.91	0.70	5.21	0
2021	5.21	0.70	4.51	0.39
2022	4.51	0.70	3.81	1.09
2023	3.81	0.70	3.11	1.79
2024	3.11	0.70	2.41	2.49
2025	2.41	0.70	1.71	3.19
2026	1.71	0.70	1.01	3.89
2027	1.01	0.70	0.31	4.59
2028	0.31	0.70	-0.39	5.29

Year	Permitted Reserves at Start of Year 2.64 mt with additional reserves of 7.47 mt secured giving a total of 10.11 mt as end of 2013 and beginning of 2014	Draw Down During Year as per the 10 Year Sales Average per year (0.70 mt)	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 4.90 mt
2029	-0.39	0.70	-1.09	5.99
2030	-1.09	0.70	-1.79	6.69

Table 33 : Kent Landwon Sharp Sand and Gravel Sales 2004-13

Year	Tonnes
2005	1,171,000
2006	760,574
2007	1,078,357
2008	827,208
2009	764,000
2010	763,924
2011	619,855
2012	652,285
2013	273,000
2014	172,672
Total Sales	7,082,875
Average sales 2011-13 (3 years)	0.36 mt
Average sales 2009-13 (5 years)	0.49 mt

Year	Tonnes
Average sales 2004-13 (10 years)	0.70 mt

Table 34 Landbank Calculations for Landwon Soft Sands with Preferred Site Options Included

Year	Permitted Reserves at Start of Year 8.04mt additional 16.42 mt from Preferred Options Sites Total 24.46 mt	Draw Down During Year as per the 10 Year Sales Average per year (0.601 mt)	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 4.207 mt (in any one year)
2014	24.46	0.601	23.86	0
2015	23.86	0.601	23.26	0
2016	23.26	0.601	22.66	0
2017	22.66	0.601	22.06	0
2018	22.06	0.601	21.46	0
2019	21.46	0.601	20.86	0
2020	20.86	0.601	20.26	0
2021	20.26	0.601	19.66	0
2022	19.66	0.601	19.06	0
2023	19.06	0.601	18.46	0
2024	18.46	0.601	17.86	0
2025	17.86	0.601	17.26	0
2026	17.26	0.601	16.66	0
2027	16.66	0.601	16.06	0
2028	16.06	0.601	15.46	0

Year	Permitted Reserves at Start of Year 8.04mt additional 16.42 mt from Preferred Options Sites Total 24.46 mt	Draw Down During Year as per the 10 Year Sales Average per year (0.601 mt)	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 4.207 mt (in any one year)
2029	15.46	0.601	14.86	0
2030	14.86	0.601	14.26	0

Appendix E: Appendix E: SEEAWP letter of Approval

SEEAWP South East England Aggregates Working Party

Technical Secretary: Richard Read BA, MRTPI .

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Brian Geake

Principal Planning Officer

Kent County Council

20 November 2015

Dear Bryan

Kent Local Aggregate Assessment (LAA)

SEEAWP thanks you for consulting its members on the draft LAA for 2015. At its meeting on 10 November this was one of eight LAAs considered at the meeting.

The evidence from the LAAs 2015 so far submitted to SEEAWP clearly indicates that the south east was continuing to make an appropriate contribution to aggregate supply regionally and nationally.

During the discussion at the meeting some general points arising from the LAAs were made. An issue was that south east England would in due course depend increasingly on alternatives to local extraction. This matter stressed the need to safeguard appropriate infrastructure. Additionally some mineral planning authorities would require more supply from its neighbours and this need to be taken into account in mineral plans. Finally, it was recognised that the supply of soft sand was becoming a challenge as significant proportion of the resource is within designated land.

It was also agreed that once all the LAAs had been submitted a short summary would be provided by the Secretary on all the key statistics to provide an overall picture for the south east of England

Additionally some specific comments arising from your authority's LAA were recorded in the Minutes that have now been circulated. I trust that these will be taken into account by you when you draft your Authority's LAA for next year.

Nevertheless, the Kent LAA was agreed.

Yours sincerely

Tony Cook - SEEAWP Chairman

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