

Fourth Local Aggregate Assessment for Kent



November 2016



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i Abbreviations and Glossary of Terms

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

'simple' landbank	A 'simple' landbank comprises of sufficient permitted reserves to last at least 7 years at a determined extraction rate per annum, normally equal to the last ten year average annual extraction rate calculation.
Maintained landbank	A maintained landbank is that which can be said to be maintained in any one year at a certain level of reserves. For example a maintained 7 year landbank means for any one year there is 7 years of productive capacity, in that reserves are being drawn down at a steady predictable rate (normally expressed as an average extraction rate from calculated from past production records) and that for each year of the Plan period 7 years of production is possible.

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 2016 using data from the latest Aggregate Monitoring (AM) survey for 2015, and is accurate up until the end of 2015 in terms of landbanks. A key purpose of the LAA is to set out how aggregate needs and supply are changing on an annual basis in the County and to inform aggregate supply policy. 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 adopted Kent Minerals and Waste Local Plan 2013-30 at this time.

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 and potential future supply for these materials are as follows:

- the soft sands permitted landbank, at the end of 2015 was 8.18mt (a slight increase over 2014 due to new reserves being permitted). This would maintain a 7 year landbank of at least 4.16mt of permitted reserves in any one year, with an extraction rate equal to the 10 year average sales figure of 0.594mt, until 2016/17, some 13 years before the end of the Plan period. A 'simple' landbank would last almost 14 years based on the ten year sales average, and would take reserves availability up to 2018. With the anticipated⁽¹⁾ additional reserves coming on stream (that may be sustainably extracted) there be sufficient material to meet the maintained landbank requirement. for the whole of the adopted plan period. 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 as being the soft sand available reserve in Kent.
- the sharp sands and gravel landbank, at the end of 2015 was 3.79mt. The re-calculation of existing permitted reserves across the sites in Kent has increased this from the previous reserve figure of 2.64mt in 2014. However, this does not give a 'simple' 7 year landbank based on the 10 year average sales

1 meaning the potential reserves identified in the Minerals Sites Plan Preferred Options Consultation document of 2012

data for Kent at 2016. given the current permitted reserves of only 3.79mt an additional 0.51mt is required to give the 'simple' 7 year type landbank. Moreover, this would be depleted at an anticipated rate of 0.61mtpa based on the last 10 year sales averages. To have a maintained or rolling 7 year landbank would require significant amounts of new permitted reserves to come forward. Those that are identified in the Kent Minerals and Waste Local Plan Preferred Options Consultation (May 2012)⁽²⁾ sites, at the maximum resource estimation, would provide for a maintained or rolling landbank until 2024, some 6 years short of the end of the Plan period. Alternatively a 'simple' landbank of 18 years (until 2034) could be provided. Though this is not currently considered as a likely as none of these replenishment sites are coming forward at this time.

- the hard rock permitted landbank at the end of 2015 was in the order of 47-48 mt. This would maintain a 10 year landbank of 7.8mt (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. Clearly hard rock reserves in Kent will be sufficient for the adopted Plan period until 2030.

1.0.4 It is clear to the County Council that the landwon aggregate supply is tenuous, with particular regard to future sharp sands and gravels supply. This mineral reserve will increasingly need be substituted in the supply chain by both alternative aggregates from the recycling and secondary aggregate sector and the overall importation capacity of the area's wharves and railheads. Moreover, there is good indication that sources of aggregate supply from outside Kent in the wider UK (and further abroad) are 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 1.9mtpa.
- Wharf capacity in the County overall is an estimated 7.65 mtpa and railhead estimated capacity is in excess of 2.7 mtpa.

1.0.5 When considered together these alternatives to landwon sharp sands and gravel could provide over 12.25 mtpa of aggregate supply. This is more than adequate to meet Kent's needs at this time, this being 0.61mtpa, and continue to provide those exports to other areas outside Kent that are currently part of the existing overall

2 The weight that can be afforded to these potential replenishing reserves may be considered as reducing in that their assessment of acceptability and deliverability was last done in 2012, and may be regard as increasingly out of date. Notwithstanding this they currently represent the only assessed potential new reserves that have been assessed to a Preferred Options consultation in accordance with Regulation 18 of the local planning regulations for England of 2012. The current Call for Sites exercise (late 2016) has not yet progressed to a comparable state

import/export balance. Although there is a current underutilisation of the capacity across Kent's wharves and railheads, the capacity remains fragile and at risk from other development. 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 aggregate needs into the future.

1.0.6 The Local Aggregate Assessment (LAAs) for the South East area county councils and unitary planning authorities are required to be ratified by the South east England Aggregate Working Party (SEEAWP). Kent County Council's LAA was shared and agreed in draft form with the Aggregate Working Party (AWP) for evaluation and comment. Government will expect AWP's 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 fourth LAA that Kent County Council has produced. Is a technical monitoring document to inform mineral planning policy. The County Council has now adopted (July 2016) the Kent Minerals and Waste Local Plan 2013-30 (Kent MWLP) that sets the overarching requirements for both naturally occurring landwon aggregate supply and the proportion of which recycled and secondary resources can contribute to meeting overall aggregate needs. The requirement of the LAA to assess aggregate supply annually enables the local plan to be reviewed to ensure that they remain up to date and relevant to evidence-led decision making. This is in addition to other monitoring work such as the Annual Monitoring Report (AMR).

2.0.2 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.

2.0.3 In Kent these main geological units supply building sands (largely unconsolidated sands of the Folkestone Formation) and hard rock (limestone the Kentish Ragstone of the Hythe Formation); the latter can be crushed to form sized aggregates. In addition 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 (FBA), 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).

2.0.4 In addition to acting as an indicator as to when mineral and waste local plan policies may need review, the main purpose of this 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. It should also help inform the minerals industry in their investment decision making and the wider community on future supply of aggregates.

2.0.5 This technical monitoring document is evidence to support planning policy formulation, it is 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 previous Kent LAA was produced and is still relevant. 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.

3.1.2 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 Aggregate Working Parties (AWP) examining any significant difference between individual Aggregate Working Party (AWP) reports and the relevant National and Sub-National Guideline figure. This national coordinating group 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 AWP's 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.

3.1.3 MPA's produce both AMR and LAA documents, which are informative to the AWP's 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

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 of England	236	8	14	117	7
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.⁽³⁾ 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).

3 National Planning Policy Framework March 2012, Para. 145, page 34.

The online Governmental Planning Practice Guidance of March (PPG) 2014 ⁽⁴⁾ essentially reinforces the requirements of an LAA as set out in the NPPF. Paragraph 062 sets out what a Local Aggregate Assessment should contain.

3.3 Managed Aggregate Supply System

3.3.1 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.⁽⁵⁾

3.3.2 MASS as a systematic approach is not a new approach to aggregate provision, as it has been in existence for over 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. This gives that the extractive industry 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 Localism 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 this is to be addressed

4 <http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/planning-for-aggregate-minerals/local-aggregate-assessments/>

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

3.3.4 The aggregate material supply options to be assessed include:

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

3.3.6 There is no maximum landbank (7 years is the minimum that should be sought) to be provided for aggregate minerals, essentially these landbanks and other supply factors need to be understood by the MPA in order for informed decisions on planning applications for new aggregate supply. There may be justifiable reasons to permit new supplies of aggregates when the calculated landbank is considered adequate. These can include:

- significant future increases in demand that can be forecast with reasonable certainty;
- the location of the consented reserve is inappropriately located relative to the main market areas;
- the nature, type and qualities of the aggregate such as its suitability for a particular use within a distinct and separate market; and
- known constraints on the availability of consented reserves that might limit output over the plan period.

3.3.7 Government advice makes clear that where there is a distinct market for a specific type or quality of aggregate (such as high specification rock, or sand used for concrete or sand for asphalt), a separate landbank calculation based on provision to that market may be justified. This is because materials of different physical properties and quality are often needed to meet different end uses, and the scope to substitute one aggregate material for another can be limited. The County Council has considered that this is a justified approach in Kent in the second and third LAA for the area and continues this into the fourth LAA for Kent. It is clear that the building sands of the Folkestone Formation serve a different construction material market than either the hard rock of the Hythe Formation (Kentish Ragstone) or the superficial alluvial and terrace sands and gravel deposits.

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. AWP's 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). This is an ongoing arrangement.

3.4.2 It is expected by Government that AWP's 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 AWP's 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 fourth Kent LAA and signed by the SEEAWP Technical Secretary. In relation to the comments referred to, at the meeting in November 2016 it was suggested that an alternative interpretation of considering local circumstances could be explored in the future. The AWP was of the view that the NPPF's requirement to consider 'local considerations' in LAAs are more appropriately confined to matters such as quarries being mothballed and thus restricting supply.

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 (alluvial) 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. This rock 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 (mostly located along the northerly coastline of the county) 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 though 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.

4.2.2 This data 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⁽⁶⁾. For construction, demolition and excavation (CD&E) waste the recorded overall permitted capacity to manage this material was and is expected to remain at some 1.9 mtpa (both temporary and permanent capacity)⁽⁷⁾. This capacity will include that which manages material from this sector that 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.

4.2.3 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 60,000 tonnes per annum. The mechanically processed IBA is used to produce drainage materials, concrete and bituminous coated products as an aggregate substitute. This operator presently continues to produce and market these materials.

4.2.4 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.

4.2.5 The study is considered to have yielded 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.

4.2.6 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

6 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

7 In January 2015 capacity grew by 7.8%. with an application for 150,000tpa being permitted, boosting overall capacity to 2.15mtpa

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)

4.2.7 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 still in the order of at least 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 a production figure of 728,714 in 2014 and the 2015 production (sales) figure of 844,946. The productive capacity of the sites in Kent to produce secondary and recycled aggregates is an estimation of the total amount any one site could theoretically produce. In 2014 this figure was given as 1.3 mtpa, while in 2015 this has significantly increased to 3.44 mtpa. The difference may well represent investment changes to site productive infrastructure. However, It should be noted that again certain 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 capacity of recycled aggregates can only be seen as indicative.

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

Year	Recycled Secondary Aggregate	Recycled Secondary Aggregate industrial by-products	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%

4 Aggregate Sources of Supply in Kent

Year	Recycled Secondary Aggregate	Recycled Secondary Aggregate industrial by-products	Totals	As a % of all aggregate materials produced in Kent (primary, secondary and recycled combined)
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%
2015	804,645	40,301	844,946	844,946/5,092,037 ⁽²⁾ =16.59%
Totals 2006-15	7,421,165	750,197	8,265,358	-
Average pa 2006-15	0.742mtpa	0.075mtpa	0.827mtpa	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
2. hard rock estimated as 0.78mt

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

- the sector remains 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 that may be recovering again as can be seen in the AM 2014 and 2015 figures.
- the average sales from the 2006 recorded peak (of 1.3 mtpa) for the last 10 years has been approximately 824,536mtpa for the secondary and recycled aggregates combined. As of 2015 the overall proportion of the secondary and recycled aggregate sector has not markedly increased, in that the landwon fraction of supply to the market has marginally risen to 5.09 mt in 2015 to that of 4.7 mt in 2014, with the secondary and recycled aggregate sector at present being 16.59% of overall aggregate supply. This is slightly down from recorded 16.63% in 2014.

4.2.9 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 16% 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 (of the North Sea and the English Channel) are an increasingly important aggregate 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 then deposited on an expansive fluvial continental plain (Doggerland). The deposition occurred as part of meandering river channel and outwash fan processes in the extensive and undulating tundra type landscape then existing. As the Pleistocene Epoch Ice Age event came to an end there was a resulting increase in sea level that inundated this low lying continental plain to form the North Sea and the English Channel. These aggregate resources are now classified as marine aggregate materials that are exploited from the sea bed today.

4.3.2 These deposits are not being replenished by new 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 2015) of just over 1.8 mtpa. Table 3 below details the landings in Kent during 2006-2015 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 2015 only due to poor data prior to 2006).

Table 3 Landings of Marine Dredged Sand and Gravel at Kent Wharves 2005-15 (thousands of tonnes per annum) ⁽¹⁾

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2006-15
ND	1950	1870	1670	1730	1524	1844	2014	1743	1938	1874	1816

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. As of the AM 2016 data there has been a reduction in overall capacity by 0.1 to 0.35 mtpa with the loss of one aggregate wharf in the Dover harbour 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

Site	Operator	Site size 2006 survey	Site size 2010 survey	Change between 2006-10
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
<i>Cliffe</i>	<i>Brett Aggregates Ltd</i>	<i>Major</i>	<i>Major</i>	<i>No change</i>
East Quay Whitstable	Brett Aggregates Ltd	Medium	Medium	No change
<i>Eurowharf Frindsbury</i>	<i>Hanson PLC</i>	<i>Large</i>	<i>Major</i>	<i>Increased capacity</i>
Red Lion Wharf	Stema PLC	Large	Major	Increased capacity
Old Sun Wharf	Fleetmix Limited	Small	Small	No change (potential wharf re-activation site)
<i>Isle of Grain</i>	<i>Aggregate Industries PLC</i>	<i>Major</i>	<i>Major</i>	<i>No change</i>
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 yet operational)
Dunkirk Jetty, Dover	Cemex PLC	Medium	Medium	No change (no longer operational as of 2015)
Sheerness	Aggregate Industries Ltd	N/A	Small	New site (no longer operational as of August 2012)
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, this has been followed in 2015 by Dunkirk Jetty (medium capacity of 0.1 to 0.35 mtpa) at Dover.

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 as of 2015. Overall Kent wharves have a total combined capacity in the order of some 7.65 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 wharf sites. The safeguarding of wharves is required by the NPPF and the County Council considers this capacity as essential to maintaining the long term steady and sustainable supply of aggregates into Kent.

End Notes

- 4.1 Further work in support of the KMWLP's Examination in 2015 was done to provide an assessment of the secondary and recycled aggregate productive capacity operating within Kent in 2014. This included 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 was 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 ⁽⁸⁾ 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 fourth 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 import/export data of the AM2009 collation (that details the information for the AM2009 report)⁽⁹⁾ 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 achieved. Marine sands and gravels landed (imported)in Kent and Medway show a similar pattern, as 20.7% were exported out of the joint survey area, see Table 5 row B.

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 some 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

8 Online at:

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

9 Collation of the results of 2009 aggregate minerals survey for England and Wales, Second edition October 2011, this report has been produced by the British Geological Survey under a contract with the Department for Communities and Local Government

within these administrative areas. Table 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. It is of note that the Kent and Medway figures are significantly affected by the Grain deep water terminal aggregate importation wharf.

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 generated ⁽³⁾ in Kent and Medway as expressed as sales	1362	2825	3760	7947
B. Exported out of Kent and Medway (assumed as A-C)	183 or 13.4% of all material generated by area	585 or 20.7% of all material generated by area	1770 or 47% of all material generated by area	2580 or 32.5% of all material generated by area
C. Consumption in Kent and Medway ⁽⁴⁾	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

5 Import and Export Balance

	Landwon Sand and Gravel Kent and Medway ⁽¹⁾	Marine Sands and Gravel Kent and Medway	Crushed Rock ⁽²⁾	All primary aggregates production
Overall Import (-ve) and export (+ve) balance in tonnes (x 1,000)	+104	+399	+1430	+1937
	7.64% of all material generated was not consumed in the area 92.36% was consumed in area	12.76% of all material generated was not consumed in the area 87.24% was consumed -in area	38% of all material generated was not consumed in the area 62% was consumed in area	23.48% of all material generated was not consumed in the area 76.52% was consumed in 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. The term generated includes all materials that are imported and have arisen from extraction of the area's indigenous geology
4. 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⁽¹⁰⁾ details the 2009 sales destination findings for Kent.

10 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

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	-

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 ⁽¹¹⁾	Sharp Sands and Gravel ⁽¹²⁾	Crushed Rock ⁽¹³⁾	Secondary Aggregate	Recycled Aggregate	Total
2003	8,685	1,732,535	1,404,980	ND ⁽¹⁴⁾	ND	3,146,200
2004	15,400	1,848,597	1,434,911	ND	ND	3,298,908
2005⁽¹⁵⁾	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
Last 3 years average 2012-14	16,027	1,973,438	883,247	ND	ND	2,872,712

13 Landwon in origin from outside Kent including that sold for engineering bulk fill purposes

12 Landwon and marine in origin for aggregate use

11 Landwon and marine sources outside Kent

14 ND indicates no data available

15 Kent and Medway combined data in SEERAWP Annual Report 2005

Year	Soft Sands ⁽¹¹⁾	Sharp Sands and Gravel ⁽¹²⁾	Crushed Rock ⁽¹³⁾	Secondary Aggregate	Recycled Aggregate	Total
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. In 2015 the figure had risen again to 3.3mt demonstrating the overall importance to total aggregate supply (some 5.1mt as of 2015). Total aggregate sales in Kent of all types and via all means (including secondary and recycled materials) amounted to 4.4mt in 2012 and 4.6mt in 2013. The average for the past 7 years has been almost 3.0mtpa.

5.1.9 Thus imports via wharves and railheads represented some 66% and 57.6% of Kent's overall aggregate supply in 2012 and 2013 respectively. In 2015 importation accounted for some 60% of Kent's supply. Although Kent is a limited net exporter of aggregate materials (based on the AM2009 data), the role of importation via wharves and railheads in meeting the county's own needs remain 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 may have increased, as per the trend identified between 2012 and 2013. This conclusion is given added emphasis given reductions in recent landwon aggregate (sand and gravel) production and the observed rise of imports showing a 19% increase since 2013.

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 was informative. Though this exercise has not been updated to any marked extent the relationship with Essex County Council, as given in the Statement of Common Ground in Appendix C remains in place. Many of the operators who import to Kent own and operate quarries internationally, as well as the importation infrastructure in Kent. The international import materials come from Denmark, France,

13 Landwon in origin from outside Kent including that sold for engineering bulk fill purposes

12 Landwon and marine in origin for aggregate use

11 Landwon and marine sources outside Kent

Ireland, Norway and the Netherlands. The majority of these aggregate imports are crushed rock, though land-won sand and gravel is also represented. Elements of Norwegian and Danish supply have reserves that 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 2015 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 specification 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 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. The following gives a historical perspective only, the RSS requirements are not longer effective, though the reasoning behind them in terms of availability of materials is of value to the LAA system that has replaced the RSS in terms of aggregate provision in Kent.

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 in Kent has averaged 0.807mtpa over the last 5 years, and 1.21 mtpa over the past 10 years, see Table 9 (further per year table in Appendix D, Table 30). In 2014 the LAA demonstrated a 10 year average of 1.40 mtpa for all landwon sands and gravels. This represents a falling in sales 2015 of 0.19 mt, greater than the drop in sales observed in 2014 of 0.16 mtpa compared to 2013 sales. It is considered likely that the 10-year rolling average figures for landwon sand and gravel in Kent will continue to fall 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 from 2011 onwards.

Table 9 Kent all Landwon Sand and Gravel Aggregate Sales 2005-15

Year	Tonnes
Average sales 2012-15 (3 years)	0.646 mtpa
Average sales 2011-15 (5 years)	0.807 mtpa
Average sales 2006-15 (10 years)	1.209 mtpa

6.2.2 Bulk engineering fill aggregates and Hoggin sales are considered as a more marginal (though not always insignificant) use of resources. 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 ⁽¹⁾
2010	3,802	
2011	9,759	

Years	Sales in tonnes	Averages
2012	228	
2013	0	
2014	ND	2005-14 40,069 tonnes
2015	37,292	

1. tonnes unrepresentative due to a lack of meaningful data

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 that was significant in that the KMWLP 2013-30 was going through its Independent Examination at the time (Hearings held in April/May 2015) and some form of figure had to be devised.

6.3.2 The position has not changed, thus Kent's fourth LAA has adopted the same approach as detailed in Table 11 below. The sales data since 1998 to 2001 for Kent is shown. The confidentiality of sales first kicked in in 2002, given that only two sites operate in Kent as of 2002. As indicated in Table 11 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 2015 this arrangement has not altered.

Table 11 Kent Landwon Crushed Rock sales 1998-2015⁽¹⁾

Year	Thousand Tonnes
1998	700
1999	700
2000	954
2001	1,240 (figure rounded to preserve confidentiality)
2002 through to 2015	C
Average 2002-15	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 12 and 13 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 12 (a full demonstration of how the yearly sales average would configure against the current reserves and those that are anticipated to be replenishments are to be found in Appendix D Table 29) 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⁽¹⁶⁾.

Table 12 Kent Landwon Sharp Sand and Gravel Sales 2005-15

Year	Tonnes
Average sales 2013-15 (3 years)	0.23 mtpa
Average sales 2011-15 (5 years)	0.39 mtpa
Average sales 2006-15 (10 years)	0.61 mtpa

6.4.2 The 10 year rolling average has reduced from 0.70mtpa (based on AM 2014 data) to 0.61mtpa, and it may decline further 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 fourth LAA) to only 0.23 mtpa in 2015. 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, and continue to do so. Reductions in the overall proportion of aggregates from the landwon resource may well account for this observation.

6.4.3 Table 13 below shows the sales data from AM surveys for Kent's soft sands (a full demonstration of how the yearly sales average would configure against the current reserves and those that are anticipated to be replenishments are to be found in Appendix D Table 30).

¹⁶ 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 when published

Table 13 Kent Landwon Soft Sand Sales 2005-15

Year	Tonnes
Average sales 2013-15 (3 years)	0.42 mtpa
Average sales 2011-15 (5 years)	0.41 mtpa
Average sales 2006-15 (10 years)	0.60 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 2015 is 0.01 mtpa lower than the same average calculated on 2014 data, a 1.6% overall reduction in soft sand sales. Given the greater permitted reserve base (to be more fully considered next in section 7) for 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.

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 14 below details the extent of Kent's landbank of permitted aggregate reserves in the AM2015 survey data, which records data of the previous 12 months sales. Though no new planning permissions have been granted as of the end of that year (2015) the reserves have changed since the previous AM period in 2014. There has been an increase in reserves from the recorded 2.64mt in 2014 to 3.79mt in 2015. There has been a degree of re-surveying of permitted reserves, this has led to a recorded increase in the overall reserve base for the sharp sands and gravels.

7.1.3 Soft sand reserves increased as a result of new planning permissions in 2015, though the increase was not significant at 1.7% of the 2014 reserve base. The hard rock reserves are 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 2014.

Table 14 Permitted Reserves: Construction Aggregates as End of 2015

Type	Total Permitted Reserves (mt)
Sharp Sand and Gravel (including sandstone gravels)	3.79mt
Sand and Gravel or Hoggin ⁽¹⁾ For use as construction bulk fill	Not comprehensively monitored
Soft Sands ⁽²⁾	8.18mt (two new permissions in 2015)
Hard Crushed Rock (Kentish Ragstone)	Current reserves confidential though estimated to be in the region of 40-50 mt

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

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 11.969mt (as of the end of 2015, down 0.71mt from the total 12.68mt in 2014). A simple landbank calculation based on the reserve figure divided by the 10 year average gives some 9.8 years of reserves, some 1.98 years greater than a 7 year landbank. Table 15 below details these calculations:

Table 15 Soft and Sharp Sands and Gravel Combined Landbank in Kent 2015

10 Year Sales Average 2006-15 (A)	1.220mtpa
Permitted Reserves as End of 2015 (B)	11.969mt (excluding Hoggin materials)
Current Landbank Duration (B divided by A)	9.8 years
Maintained Landbank Required by NPPF (1.220 mtpa being maintained held at a quantum equal to 7 years average production)	8.54mtpa
Current landbank 11.969mt, 8.54mt for a 7 year landbank	NPPF compliant landbank of at least 7 years

8.1.2 However, the two geologies are distinctly different. Soft sands are a crustal 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 the 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 (in 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 Kent 2015 LAA is that Government guidance now allows for separate landbanks for distinctly different aggregate mineral types to be considered.

8.1.4 Therefore, the current simple landbank position with regard to the sharp sands and gravel in Kent can be calculated, this is shown in Table 16 below:

Table 16 Kent's Sharp Sands and Gravel Landbank in 2015

Requirements	Computation results to meet NPPF Landbank Requirements
10 Year Sales Average 2006-15 (A)	0.61mtpa
Permitted Reserves at End of 2015 (B)	3.79mt
Current Landbank Duration (B divided by A)	6.16 years
Maintain Landbank Required by the NPPF (0.615mtpa average based on 10 years of production held at a quantum as reserves equal to 7 years average production)	Maintain 4.3mt of available reserves (this being the 10 year average production multiplied by 7)
Current permitted landbank 3.79mt, 4.3mt required for a 7 year landbank	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 0.61mtpa, it falls short by 0.78mt and would only last 6.2 years as of the end of 2015. Correspondingly, if a maintained 7 year rolling landbank is required (the NPPF could be interpreted in this manner) based on the available reserves is simply not possible in Kent.

8.2 Kent Soft Sands

8.2.1 Table 17 below demonstrates that there is a relative abundance of reserves for soft sands in the County Council's area. A significant permitted reserve at Aylesford Sandpit has been (during 2015) re-classified as predominantly a silica sand reserve site. The remaining workable 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 the 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 17 Soft Sands Landbank in Kent 2015

Requirements	Computation results to meet NPPF Landbank Requirements
10 Year Sales Average 2006-2015 (A)	0.594 mtpa
Permitted Reserves as End of 2015 (B)	8.18mt ⁽¹⁾
Current 'Simple' Landbank Duration (B divided by A)	13.77 years

1. two recent planning permissions have contributed another 2.5mt to reserves

8.2.2 The current landbank of soft sands is sufficient for a 'simple' landbank calculation based on the predicted rate of depletion would last almost 13-14 years (until 2028-29). If a 7 year rolling landbank is required to be maintained then 4.16mt would be required to be available per year, Kent's reserves would last for 1.97 years in this case.

8.2.3 The 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. These operators have (during 2015) made clear what type of sand reserves are permitted at their sites. Therefore, the County Council has concluded that the overall soft sand landbank calculations are representative of the reserve base in Kent.

8.3 Kent Crushed Hard Rock

8.3.1 Given the need to preserve the confidentiality of Kent's two operational 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 6.3.1 to 6.3.3) this is based on the apportionment that Kent had received in the revised Policy M3 of the RSS when it was in force.

8.3.2 It is quite clear from Table 18 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 over the Plan period.

Table 18 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 reserves can be maintained in any one year to give a 10 year maintained landbank to 2030 and beyond

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 year NPPF compliant landbank (that requires at least 10 years of permitted reserves to be maintained in any one year) would be maintained through the adopted Plan period, with some 34.18 mt of reserves remaining in 2030.

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 decline recently in sales of sands and gravels from a high of 1.2 mt in 2009 to a low of 0.48 mt in 2015 for the soft or building sands and gravels. This trend has continued with an observed fall in the ten year sales average from 0.78 mtpa (AM2013) to 0.615 mtpa (AM2015) for sharp sands and gravels. The reasons for the decline may be associated with the recession event since 2008 and a number of other factors. This may include reductions in the intensity of aggregate use in construction design, with greater use of alternatives to landwon aggregates from the recycled and secondary aggregate sector (in Kent this has grown from 0.475mt in 2003 to 0.77mt in 2012 and 0.845mt in 2015). 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 with certainty, 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 and fourth Kent LAAs 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 again with the more recent housing projections available to determine if any higher degree of certainty can be 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 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*

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 the 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 up to 2031/32 (21 years); 160,300 projected, or an average of 7,633 per annum (an increase of 23% on previous projections in 2015) across the county

9.2.4 The application of the assumed 60 tonnes per house consumption means that for the housing sector 457,980 tonnes are required per annum. Meaning that a total of 9.60mt (an increase from the 7.04mt tonnes in 2014 as projected) of aggregates are required between 2011/12 and 2031/32 for the Kent (excluding Medway) wide projected housing growth.

Education Infrastructure

9.2.5 KCC has a key role in the provision of 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 this LAA the projected expenditure will be realised⁽¹⁷⁾. 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 of 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. On this assumption the education sector may consume some 939,000 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. This calculation remains the same from previous LAAs.

9.2.7 The 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. However, It is recognised that there are difficulties in striking

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

the right balance between the use of the different aggregate types that would be used by this construction sector. The higher, 1.3 tonnes per £1,000 of construction output, can be seen as a reasonable compromise in the absence of defining how much crushed rock and sand and gravels would be used as distinct calculations.

Major Projects (non-infrastructure) - Paramount Park

9.2.8 The third and fourth LAAs for Kent considered the potential for non-infrastructure major projects that may have occurred over the plan period. The situation has not materially altered. The following projects have been identified and remain to be realised.

9.2.9 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 £1,000 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)

9.2.10 On these assumptions, the proposed development would require up to 2.6 million tonnes of aggregates.

9.2.11 Consideration needs to be given to new highway infrastructure that has the potential to require significant volumes of aggregates. The Lower Thames Crossing is anticipated to commence 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 600,000 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 4,160,000 tonnes (1.3 tonnes per £1,000 of construction output for a £1.2 to £3.2 billion project)

9.2.12 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 would have a higher range of

crushed rock and a lower range of sand and gravel. 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.

9.2.13 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

9.2.14 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. The assessment of aggregate use is complex, the programmed 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.

9.2.15 Another significant scheme, the proposed dualling of the A21 between Tonbridge to Pembury, 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 (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 million 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)

9.2.16 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.

9.2.17 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 as advised by the KCC Transport Strategy. 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)

9.2.18 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

9.2.19 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.

9.2.20 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 0.99 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 and beyond, the following broad aggregate requirements can be predicted in Kent:

- **House Building** - approximately 9.60 mt of aggregate for the period 2013 to 2030.
- **Education Infrastructure** - up to 0.939 mt aggregate for the period 2014 and 2031.
- **Major Projects** - up to 6.5 mt of aggregate for the period 2013 to 2030.
- **Highways Infrastructure** - approximately 1.40 mt of aggregates for the period 2015-21.

- **Highways Infrastructure Maintenance** - up to 0.99 mt of aggregate for the period 2013 to 2030.

9.2.1.2 On the above assumptions it can be concluded that between 2015 and 2031 a potential maximum of 19.43 mt of aggregates of various kinds will be required.

9.2.1.3 The NPPF's online Planning Practice Guidance does not indicate over what time span a forecast of aggregate demand should be made. The now adopted Kent Minerals and Waste Local Plan 2013-30 is an extended forecast. 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 forecast period.

9.2.1.4 Provided the following 7 year 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 7,633 new housing units per annum, totalling 53,431 units for 7 years.
- £722.40 million on educational infrastructure, to be delivered 2014-31. For the period of the next 7 years till 2021, the predicted spend would be £297.50 million.
- Paramount Park constructed by 2018/19 at a cost of £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 £313.6 million.

9.2.1.5 Then the required aggregate supply breakdown for a 7 year period are as follows:

1. **House Building** - would require 3.2 mt of aggregate.
2. **Education Infrastructure** - would require 0.387 mt of aggregate.
3. **Major Projects** (Paramount Park) - would require 2.6 mt of aggregate.
4. **Highways Infrastructure** - would require 0.96 mt of aggregate.
5. **Highways Infrastructure Maintenance** - would require 0.407 mt of aggregate.

9.2.1.6 The amount of aggregate material, that may be required over the next seven years may well be in the region of 7.554 mt 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 lesser degree, as all models do. Comparison to actual recorded aggregate consumption may indicate to what degree these weakness exist. Therefore, when this comparison exercise is 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.

9.2.1.7 Table 19 below demonstrates the results of the two different approaches.

Table 19 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
Aggregate Demand	Soft Sands 0.595 x 7= 4.165mt Sharp Sands and Gravel 0.615 x 7= 4.305mt Hard Rock 0.78 x 7= 5.46mt	Overall Aggregate Total Requirement 7.554mt	
Total Aggregate Demand	Overall Aggregate Total Requirement 13.93mt	Overall Aggregate Total Requirement 7.554mt	54.22% variation between methodologies

9.2.1.8 The local circumstances modelled demand in the second Kent LAA is 54.22% 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. However, the local demand model does not include any aggregate use for construction of the Lower Thames Crossing which is unlikely to before 2022 due to a the uncertainty with its implementation.

9.2.1.9 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. With regard to aggregates the NPPF requires a *steady and adequate* supply to be maintained, primarily with the use of a 7 year 'simple' landbank for sands and gravels and 10 years for hard rock.

10.0.2 In order to address limitations in the supply of both soft sands and sharp sands and gravels the authority had commenced the process of identifying sites where potentially economically important minerals may be extracted in an environmentally acceptable 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 and Waste 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).

10.0.3 It was decided to suspend progress with the minerals and waste sites plans at this point to enable the Kent Minerals and Waste Local Plan 2013-30 to be progressed through to Independent Examination and eventual adoption. This was achieved in July 2016. A considerable amount of time had elapsed since 2012 when the Mineral and Waste Sites Preferred Options consultation had occurred; this may well make the conclusions of the consultation now unreliable. Sites that were then considered deliverable may now not be. Therefore a second call for sites exercise is now considered appropriate, this will be held in late 2016/17. However, for the purposes of the fourth LAA for Kent the results of the first consultation exercise will be used to indicate the extent of potential new sustainable aggregate mineral resources, whilst recognising that these sites have not been independently examined.

10.0.4 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 4.16mt of permitted reserves by 2017/18. Though a simple landbank would currently last some 13 to 14 years until 2028, two years short of the adopted Plan period. Several further soft sand sites were proposed by operators for consideration as part of the Mineral Sites Plan's 'Call for Sites' that were subsequently considered to be Preferred Options in 2012, 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 (permitted in 2015);
- Boltons Field, Lenham Heath, estimated resource 0.635 mt;
- Chapel Farm, Maidstone, estimated of resource 3.5 mt;
- Burleigh Farm and Tile Lodge, Charing, Ashford, estimated of resource 2.7 mt (permitted in 2015);
- Shrine Farm, Postling, Shepway, estimated of resource 8.0 mt;
- Borough Green Sandpit Extension, Wrotham, Tonbridge and Malling, estimated resource 0.4 mt (permitted in 2016 and will be included in AM2015 as reserves)

10.0.5 The total potential 'new' replenishing reserves available for the future from these Preferred Options sites amount to an estimated 13.53mt. If these reserves were come forward they would enable a 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 adequate supply of this aggregate type would be constrained by a lack of resources that may reasonable be considered to be able to become permitted reserves during the Plan period until 2030. However, this is replenishment scenario may not represent the a realistic assessment of future preferred options given that the County Council is to undertake a new Call for Sites exercise in 2017. Some of the sites already identified may not be represented in this exercise and the 13.53mt of replenishing reserves may in fact change.

10.0.6 Table 20 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 20 Landbank Calculations for Landwon Soft Sands with Preferred Sites Options Included

Year	Permitted Reserves with additional Preferred Options Reserves ⁽¹⁾ modelled together as available reserves 21.71mt	10 Year Sales Average Draw Down Figure 0.595 mt	Remaining Reserves End of Year mt	Cumulative Further Reserve Requirements for a 7 year Landbank of at least 4.16 mt
2015	21.71	0.595	21.11	0
2022 (plus 7 years on)	17.54	0.595	16.95	0
2030 (end of Plan period)	11.59	0.595	10.99	0

1. Allocated sites in the Kent Minerals Sites Plan - Preferred Options 2012

10.0.7 By the end of the anticipated emerging Plan period there would be some 10.99 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 can be argued as unrealistic.

10.0.8 The sharp sand and gravel land bank calculations in section 8.1.4 to 8.1.5 and Table 16 demonstrates that a marked under supply currently exists, a 'simple' 7 year 4.3mt landbank is not being provided at this time. 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 cusplate foreland formed by long shore drift of storm beach deposits). 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.

10.0.9 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.

10.0.10 Several sharp sand and gravel sites were proposed by operators, landowners and their agents for consideration during the 2010 'Call for Sites' exercise. A number of sites were not allocated as Preferred Options in 2012 for a number of reasons, including site operational difficulties, limited resources and environmental constraints. They include the following non-allocated sites:

- Arnolds Lodge Farm West, East Peckham, Tonbridge and Malling, estimated resource 0.2 mt;
- Woodfall's Farm, Yalding, Maidstone, estimated resource 1.5 mt;
- Filston Lane, Shoreham, Sevenoaks, estimated resource 0.6 mt;
- Ham Farm, Faversham, Swale, estimated resource 1 mt;
- Hollowshore Farm, Faversham, Swale, Estimated resource 1.15 mt
- Lydd Quarry, Allens Bank Quarry extension, Lydd, Shepway, estimated resource 0.3 mt

10.0.11 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 4.75 mt.

10.0.12 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 0.3 t.
- 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.

10.0.13 Additional permitted reserves of between 5.47-7.47 mt could potentially come from these sites, which were identified as acceptable Preferred Options in 2012. They could come forward during the Plan period. The maximum range of potential sharp sands and gravel landbank calculation for both the 10 year and the 3 year sales averages is shown in Table 21 below.

Table 21 : Sharp Sands and Gravel landbank in Kent with Current Reserves and Potential New Reserves

year	Permitted Reserves with Preferred Options Potential Reserves forming Overall Reserve Base	10 Year sales Average	Further Reserves Required to Maintain Simple 7 Year Landbank of 4.3mt	3 Year Average Sales Figure	Further Reserves Required to Maintain Simple 7 year Landbank
2015	9.26 to 11.26mt	0.61mt	0	0.23mt	0
2022 (plus 7 years on)	4.99 to 6.99mt	0.61mt	0	0.23mt	0
2030 (end of Plan period)	0.11 to 2.11mt	0.61mt	4.19 to 2.19mt	0.23mt	0

10.0.14 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 'simple' landbank of sharp sands and gravel throughout the life of the anticipated Plan 2013-30 (Table 29 in Appendix D shows the breakdown if a maintained 7 year landbank is required). If the replenishment reserves came online at the *beginning* of the Plan period, in total, then there would be sufficient reserves for an approximately 10 year 'simple' landbank (2015-2024), this would be past the period of the Plan that ends in 2030. As in common with all modelled scenarios, the underlying assumptions can be unrealistic. The full potential replenishment from the identified Preferred Option sites coming forward early on in the Plan's period is considered unlikely. This is largely confirmed by the given that no new planning permissions have been granted for sharp sands and gravels in 2015.

10.0.15 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. Further analysis of more recent sales averages shows a corresponding lowering of the average quantities for the sharp sands and gravels sales. 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 0.23 mt (see Table 21 columns 3 and 4 above). A 'simple' landbank would last for 49 years, well in excess of the required at least 7 years and well past the end of the Plan period. However, is not considered a realistic model given that the replenishing reserves appear not to be coming forward by way of successful planning applications. There is a marked lack of urgency being displayed by the extractive industry. It is the case that none of the Preferred Options sites have come forward as planning permissions as of 2015.

10.0.16 Hard rock supply, in terms of permitted reserves, is abundant and poses no real difficulties for supply beyond the Plan period. 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. Also, it should be appreciated that a 'simple' landbank of aggregate type in Kent would last 20 years, well beyond the 10 years as generally considered as the NPPF requirement.

11 Conclusion

11.0.1 Kent's fourth LAA has not highlighted any particular 'local circumstances' over and above the need projection and the fact that the sharp sands and gravels landbank is not being replenished to any marked extent. The use of the ten year average sales based forward prediction methodology should remain the primary tool in Kent at this time as it represents probably the more realistic methodology.

11.0.2 Recent reductions in sales prompted an analysis of the last three year average sales data on reserve life that included the reasonably anticipated replenishing reserves. However, it could be argued that the 3 year average is a less reliable proxy than the 10 year average. This being due to the effect of the recent economic recession, particularly during 2008-09 (which may still be having an impact in 2015) and 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 and has significantly reduced Kent's overall landwon output over recent years. This has been without commensurate new permitted reserves coming on stream to replace this lost output. Continued reduction in overall sales is anticipated to continue unless the production lost to East Sussex is replaced in elsewhere Kent.

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 now adopted Kent Minerals and Waste Local Plan 2013-30 (the Plan). 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 2015 was 8.18mt (a slight increase over 2014 due to new reserves being permitted). This would maintain a 'simple' 7 year landbank of at least 4.16mt of permitted reserves in any one year, with an extraction rate equal to the 10 year average sales figure of 0.594mt, some 13 years before the end of the Plan period. A 'simple' (and arguably NPPF compliant) landbank would last almost 14 years based on the most recent ten year sales average. This would take reserves availability up to 2030.
- the sharp sands and gravel landbank, at the end of 2015 was 3.79mt (re-calculation of existing permitted reserves across the sites in Kent has increased this from the previous reserve figure of 2.64mt in 2014). However, this does not give a 'simple' 7 year landbank for Kent (this requires at least 4.3mt based on the last 10 year sales data). Given the current permitted reserves of only 3.79mt an additional 0.51mt is required to give the 'simple' 7 year landbank at this time. Moreover, this would be depleted at an anticipated rate of 0.61mtpa based on the last 10 year sales averages. Moreover, to have a maintained 7 year landbank in any one year of the adopted Plan would require significant amounts 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 'simple' 7 year landbank for 10 years until 2024, this being 6 years before the end of the Plan period. As with the soft sand replenishing reserves, it is not considered likely that these will come forward in a timely fashion, particularly as none of these replenishment Preferred Option Sites sites are coming forward at this time.

- the hard rock permitted landbank at the end of 2015 was in the order of 47-48 mt. This would maintain a 10 year landbank of 7.8mt (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. Clearly hard rock reserves in Kent will be sufficient for the adopted Plan period.

11.0.4 Policy CSM 2 of the Kent Minerals and Waste Local Plan recognises the limitations in supply of landwon aggregates in the County Council's area, with particular emphasis on the sharp sands and gravels. At the Plan's Examination Hearings it was agreed that an alternative strategy to meet shortfalls 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 7% increase in 2015 compared to 2014, and are at 3.3mt overall as of 2015. While data for the secondary and recycled materials used to produce secondary aggregates for 2015 showed an increase over that of 2014 at 0.84mt, this is 16.59% of all aggregate supply in the County Council's area. It appears reasonable to expect this level of alternative utilisation of materials other than landwon materials to continue.

11.0.5 The permitted capacity of Kent's wharfs is in the order of 7.65 mtpa and railheads have some 2.75mtpa giving a total of 12.25 mtpa of importation supply. Though this capacity is not evenly distributed across the County Council's area and is only a theoretical maximum. 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 increased imports and secondary and recycled aggregate materials production. This underlines the importance of the retention of importation infrastructure in Kent into the future.

11.0.6 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 adopted 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. This draft Kent LAA was considered by SEEAWP at its meeting on 21st November 2016. It will resolved to agree Kent's fourth Kent LAA, as a full understanding of how the NPPF's requirement to provide a *steady and adequate* supply of aggregates, that can be sustainably provided, in Kent into the future.

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

The most up to date list of aggregate quarries in Kent is listed below in Table 23, italics signify inactive sites, as of 2015.

Table 22 Active and Inactive Sand and Gravel and Ragstone Quarries in Kent

Quarry	Operator	Aggregate Type
Addington Sand Pit	Hanson Aggregates/Fern Aggregates	Sand and Gravel
Aylesford Quarry	Aylesford Heritage Ltd	Soft sand
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
<i>Highstead Quarry</i>	<i>Brett Aggregates Ltd</i>	<i>Sand and Gravel</i>
Lenham Quarry	Brett Aggregates Ltd	Soft sand
<i>Lydd Quarry (Scotney Court Farm)</i>	<i>Brett Aggregates Ltd</i>	<i>Sand and Gravel (extraction moved into East Sussex plant site remains in Kent)</i>
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
<i>Squeurreys Sand Pit, Westerham (no reserves post 2013)</i>	<i>Monier</i>	<i>Sand and Gravel</i>
Igtham Sand Pit	H&H Celcon Ltd	Soft Sand
Darenth and Joyce Green,(Darenth Court) Dartford	J Clubb Ltd	Sand and Gravel

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

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 23 : 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	1,000,000	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.
	4.75 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⁽¹⁸⁾. 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 1.6mpta.

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.

18 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.

District and Locality	A	B	C	D	E	F	G	H
Richborough Hall	LD	LD	LD	94,650	No			
Tilmanstone Works	LD	49,000	LD	33,371	No			
Maidstone								
Allington Quarry	LD	200,000	0.50 mt	18,418	No	#		
Thanet								
Ramesgate New Port	LD	0	LD	2,497	No	#		
Stonelees	LD	LD	LD	0	No			#
Tonbridge and Malling								
Hermitage Quarry	LD	LD	0.585 mt	LD	No		# Until reserves exhaust	
Borough Green	LD	0	LD	0	No			#
Quarry East Peckham	LD	100,000	LD	0	No			#
Ham Hill	LD	LD	LD	24,930	No	#		
Swale								
Faversham Quarry	LD	0.175 mt	0.175 mt	26,354	No		# Until reserves exhaust	

Appendix D: Aggregate Landbank Calculation Tables by Year

District and Locality	A	B	C	D	E	F	G	H
Ridham Dock	LD	60,000	LD	40,301	No	#		
Ridham Dock Road	LD	LD	LD	0	No	No longer operational		
Ridham Wharf	LD	250,000	LD	76,544	No	#		
Milton Pipes Site	LD	150,000	LD	92,000	No			
Sevenoaks								
Greatness Quarry	LD	LD		0	No		# Until restoration completed, this achieved in 2014	
Totals		1.9mt [^] plus	2.0mt [^] plus	079mt [^] plus		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 (recycled and secondary aggregates), C=EA Licence, D=Recorded Actual Production 2015, 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 indicated categories A to H)

Table 25 Kent Landwon Combined Soft and Sharp sand and Gravel Sales 2005-15 (excluding Hoggin and bulk fill aggregate sales)

Year	Tonnes
2005	1,712,000
2006	1,372,789

Year	Tonnes
2007	1,759,369
2008	1,582,798
2009	1,963,120
2010	1,385,497
2011	1,058,764
2012	1,040,031
2013	756,000
2014	564,699
2015	719,581 (Hoggin sales 37,292)
Permitted reserves	11,969,080 (excluding Hoggin at 75,000)
Average sales 2013-15 (3 years)	680,093
Average sales 2011-15 (5 years)	827,815
Average sales 2006-15 (10 years)	1,220,265

Table 26 : Kent Landwon Sharp Sand and Gravel Sales 2005-15

Year	Tonnes
2005	1,171,000
2006	760,574
2007	1,078,357
2008	827,208
2009	764,000

Year	Tonnes
2010	763,924
2011	619,855
2012	652,285
2013	273,000
2014	172,672
2015	239,366
Permitted reserves 2015	3,791,880
Average sales 2013-15 (3 years)	228,346
Average sales 2011-15 (5 years)	391,635
Average sales 2006-15 (10 years)	615,124 or 0.61mt

Table 27 :Kent Landwon Soft Sand Sales 2005-15

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

Year	Soft Sands Sales
2015	480,215
Permitted reserves 2015	8,177,200
Average sales 2013-15 (3 years)	417,434
Average sales 2011-15 (5 years)	415,791
Average sales 2006-15 (10 years)	594,847 or 0.595mt

Table 28 : Landbank Calculations for Soft Sands with Preferred Site Options Included

year	Permitted Reserves at Start of year 8.18 mt additional 13.53mt from Preferred Option Sites Total 21.71mt	Draw Down During Year as per the 10 Year sales Average per year (0.595mt)	Reserves Remaining at End of Year (mt)	Further Reserves Required (to maintain a 7 year simple landbank) of 4.16mt
2015	21.71	0.595	21.11	0
2016	21.11	0.595	20.52	0
2017	20.52	0.595	19.33	0
2018	19.92	0.595	19.33	0
2019	19.33	0.595	18.73	0
2020	18.73	0.595	18.16	0
2021	18.16	0.595	17.54	0

Appendix D: Aggregate Landbank Calculation Tables by Year

year	Permitted Reserves at Start of year 8.18 mt additional 13.53mt from Preferred Option Sites Total 21.71mt	Draw Down During Year as per the 10 Year sales Average per year (0.595mt)	Reserves Remaining at End of Year (mt)	Further Reserves Required (to maintain a 7 year simple landbank) of 4.16mt
2022	17.54	0.595	16.95	0
2023	16.95	0.595	16.35	0
2024	16.35	0.595	15.75	0
2025	15.75	0.595	15.15	0
2026	15.15	0.595	14.56	0
2027	14.56	0.595	13.97	0
2028	13.37	0.595	12.78	0
2029	12.18	0.595	11.59	0
2030	11.59	0.595	10.99	0

Appendix E: Appendix E: SEEAWP letter of Approval

Table 29

SEEAWP **South East England Aggregates Working Party**

Technical Secretary: Richard Read BA. MRTPI

Address: c/o Strategic Planning, Hampshire County Council, First Floor, EII Court West, The Castle, Winchester, SO23 8UD

Tel: 07786977547 **Email:** readplanning@btinternet.com

SEEAWP Mineral Planning Authorities

E.1 19 December 2016

E.2 Dear Head of Planning Services

E.3 South East England Local Aggregate Assessments 2016

E.4 Thank you for submitting your authority's draft Local Aggregate Assessment (LAA) for consideration by SEEAWP.

E.5 SEEAWP met on the 21 November and considered SEEAWP 16/04. The LAAs were approved by SEEAWP and the draft Minute with 16/04 are attached to the email covering this letter.

E.6 Both the report 16/04 and the Minute contain remarks which I hope that your authority will take into account, as appropriate, when finalising the current LAA. There are also further comments that you might wish to take into account when preparing future LAAs.

E.7 I appreciate your cooperation in this matter and please contact me if you require further assistance.

Table 30

Yours faithfully



Richard Read BA. MRTPI

Secretary to SEEAWP

Circulated to:

Milton Keynes Council

Buckinghamshire County Council

West Berkshire Council

Central and Eastern Berkshire Unitary Councils

Hampshire County Council

Isle of Wight Council

Surrey County Council

West Sussex County Council

East Sussex County Council

Kent County Council

Medway Council