Kent Minerals and Waste Local Plan 2013-2030

Planning for the future of minerals and waste in Kent

The Second Local Aggregate Assessment for Kent

August 2014

Kent County Council
kent.gov.uk

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i Abbreviations

AM	Aggregate Monitoring
AMR	Annual Monitoring Report
AWP	Aggregate Working Party
BGS	British Geological Survey
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
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
tpa	Tonnes Per Annum
RSS	Regional Spatial Strategy
SEA	Strategic Environmental Assessment
SEEAWP	South East England Aggregates Working Party

i Abbreviations

1 Executive Summary

1.0.1 In compliance with the National Planning Policy Framework (NPPF) Kent County Council (KCC) has produced a Local Aggregate Assessment (LAA) for 2014 using data from the latest Aggregate Monitoring (AM) survey for 2014 in conjunction with previous AM's. The LAA has analysed all relevant up-to-date data on recycled, 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 does not attempt to form policy for aggregates supply, which is the role of the anticipated and emerging Kent Minerals and Waste Local Plan 2013-30. The LAA does, however, refer to this Plan as it has the purpose of ensuring supply over its plan period.

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

- Soft Sands
- Sharp Sands and Gravel
- Crushed Rock

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

- Soft sands currently have some 14 mt of reserves, a 7 year landbank equates to 5.3 mt, (based on the 10 year average sales of 0.63 mtpa) enabling a rolling 7 land bank to be maintained until 2023.
- Sharp sands and gravels the current reserves are some 3.77mt, a 7 year maintained landbank is 6.64 mt in anyone one year (based on the 10 year average sales of 0.81mtpa)and by 2015/16 all reserves will be exhausted well before the end of the Plan period in 2030.
- Hard rock reserves (Ragstone) are some 49 mt, a 10 year maintained landbank (based on the 10 year average sales of 0.78 mtpa) requires 7.8 mt in any one year, the permitted reserves will provide the area with a maintained landbank past 2030, with a substantial reserve remaining.

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

- Soft sands reserves would total 31.14 mt, by the end of the plan period the reserves remaining would be 17.53 mt, significantly above the maintained 7 year required landbank of 5.3 mt.
- Sharp sands and gravel reserves would total 11.24 mt, the maintained 7 year required landbank of 6.64 mt ceases to be the case in 2017 and exhaustion of all permitted reserves is reached by 2024, leaving no reserves for the last 6 years of the plan period.

1.0.5 In order to maintain overall continuity of supply, importation of sharp sands and gravel, together with continued contributions from the secondary and recycled aggregate sector, will have to increasingly make up a progressive shortfall from the land-won supply as this material reaches depletion of sustainably winnable resources.

1.0.6 The County Council has investigated how reliable such supply would be, and has concluded that there is every indication that supply outside Kent from the UK and further abroad would be reliable in resource terms. There is also a current significant underutilisation of capacity across Kent's wharves and railheads. The ability to take up and use this spare capacity will become increasingly important through time and safeguarding of the importation infrastructure will be imperative in securing Kent's needs into the future.

2 Introduction

2.0.1 This is the second LAA that KCC has produced, it is a requirement of the NPPF to produce such a document each year to gain an understanding of how aggregate supply and needs may be changing, in essence it is a technical monitoring document. Aggregates are predominantly naturally occurring materials, taken from the earth's crust. Unconsolidated sands and gravels from deposits considered as 'superficial' on the land and on the sea bed are a significant source of supply, also the main geological units that form an area's geological history can be important. In Kent these units supply building sands and hard rock that can be crushed to form sized aggregates. Also, aggregates can be formed by re-using and recycling materials and as a new use for a material derived from another unrelated activity. Furnace bottom ash from the power generation sector can be used as a aggregate, often called a secondary aggregate that is, in effect, substituting 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 bulk fill for engineering projects and land stabilisation (e.g beach replenishment).

2.0.2 The main purpose of the second Kent LAA is to further the understanding of both the current local demand for and supply of aggregates in the area, to help inform decision making for planning applications and objectively assessed mineral plan policy formulation. This changes with time and has to be done on a yearly basis, it should also help inform the minerals industry in their investment decision making and the wider community on future supply of aggregates. Although this document is evidence to support planning policy formalisation, it is considered as a required technical monitoring document and therefore not a policy document. It 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 conclusion it considers shortage or and surplus of 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 the overall England's overall need for the period 2005-20 (as set out in Table 1). The sub-regional apportionments were formulated primarily for use by the now abolished regional assemblies taking into account advice from the respective MPAs. The guidance is still in place, and the National Aggregate Co-ordinating Group exists to monitor the overall provision of aggregates in England, and to provide timely advice to Government and individual AWPs examining any significant difference between individual AWP reports and the relevant National and Sub-National Guideline figure. In order to understand the reason for such a difference, and whether it raises issues of concern about ensuring a steady and adequate provision of aggregates in England. The National Aggregate Co-ordinating Group shares its findings with both the individual AWPs and Government as necessary. The body also has the role of providing guidance to Government on future National and Sub-National requirements for aggregates supply. This will include whether, and when, it needs to review National and Sub-National guidelines for aggregate provision in England.

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

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

New Regions	Guidelines for Land-won Production		Assumptions (less certain in terms of the potential quantum over the guideline time span)		
	Land-won Sand & Gravel	Land-won Crushed Rock	Marine Sand & Gravel	Alternative Materials	Net Imports to England
South East England	195	25	121	130	31
London	18	0	72	95	12
East of England	236	8	14	117	7
East Midlands	174	500	0	110	0

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

3.2 Local Aggregate Assessment Requirement of Mineral Planning Authorities

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

3.3 Managed Aggregate Supply System

3.3.1 The online Planning Practice Guidance, March 2014, part 7 of this guidance details the MASS process and how it should be applied.[(2)].

3.3.2 The MASS is not new; as it has been in existence for some 35 years. The underlying methodology is to ensure sufficient materials can be identified and brought to the market to meet local and national need through the planning system, such that

1 National Planning Policy Framework March 2012, Para. 145, page 34.
2 Online at: http://planningguidance.planningportal.gov.uk/blog/guidance/minerals/planning-for-aggregate-minerals/the-managed-aggregate-supply-system/

the extractive industry has confidence that investment plans are realistic. While the environmental concerns often directly associated with aggregate mineral exploitation are mitigated or otherwise minimised to an acceptable level. The current MASS retains this core set of principles while decentralising more power to the Mineral Planning Authorities (MPA) inline with a more localist approach to planning more generally as required by the Act.

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 surpluses of supply to meet the anticipated demand, and if there is a deficient how is this to be addressed

3.3.4 The aggregate material supply options to be assessed include:

- recycled aggregates including those from construction, demolition and excavation wastes
- 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
- land-won supply of sand and gravel and crushed rock from the MPA 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 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.

3.4 South East Aggregate Working Party

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

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

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 deposits of post glacial (Pleistocene epoch) outwash river valley and terraced sand and gravels, storm beach sands and gravels and an extensive soft sand ancient beach deposit (Folkestone Beds). Hard rock is also present in the form of a complex estuarine limestone formation that can yield important building materials and when crushed to form an aggregate (Kentish Ragstone).

4.1.2 Importation into Kent is extensive with significant capacity in wharfage and 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 capacity and arisings of the activities of the recycling and secondary aggregate sector in the county. During February 2012 to March 2013 a programme of site visits (including permanent, semi-permanent and temporary sites) was undertaken covering the whole of Kent. To establish the overall capacity in the sector the survey site visits examined plant capacity, sales data and the Environment Agency licence provisions formed the basis for the estimate of maximum production capacity. Table 25 in Appendix D details the findings of the survey.

4.2.2 The vast majority of the sites were processing materials from the construction and demolition 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 incinerator bottom ash (IBA) from the municipal waste incineration plant (Kent Enviropower) at Allington near Maidstone. The plant receiving the IBA (Ballast Phoenix at Ridham Dock) has a capacity of 50,000 tonnes per annum. The mechanically processed IBA is used to produce drainage materials, concrete and bituminous coated products as an aggregate substitute. Permanent sites are those that are reasonably anticipated to be operational well into the future, and thus the next plan cycle and beyond. 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.

4.2.3 The study is considered to yield indicative results of the productive capacity of the sector, rather than those that could be considered as definitive or absolute in type, given that there are temporary and semi-permanent mobile operations as well as permanent fixed sites. The survey period showed approximately 1.245 mt produced by the sector, though this is possibly an underestimate given that not all sites visited had any data to share and the secondary aggregate production at Ridham (Ballast Phoenix Limited) was not part of the survey at the time. 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 as four of the permanent sites visited were unable to supply meaningful data. It is to be remembered that there are often semi-permanent sites operating mobile plant at any one time linked to development projects that are not the subject of specific planning permissions or formal EA licensing requirements. This leads to data gaps in the overall amount of material produced by the construction and demolition sector.

4.2.4 The past sales data for secondary and recycled aggregates for the annual aggregate monitoring (AM) exercise is tabulated below in Table 2. By interpreting the data of the permitted capacity and EA licence provisions, where they are available, it is considered that Kent's overall permanent permitted capacity to generate secondary and recycled aggregates is in the order of 1.0 mtpa, with high probability that the true figure is well over a 1.0 mtpa, as evidenced by the 'high water mark' figure in 2007, showing a production level approaching 1.3 mtpa. Since 2007 production fell off and has started to rise again, as of 2014 the production has risen to 0.84 mtpa.

Table 2 : Secondary and Recycled Aggregate sales in Kent 2003-2012(1)

Year	Recycled Aggregate	Secondary Aggregate	Totals	As a % of all aggregate materials produced in Kent (primary, secondary and recycled combined)
2003	340,025	135,025	475,050	475,050/6,218,861=7.6%
2004	511,888	157,333	669,221	669,221/6,444,618=10.34%
2005	ND	ND	ND	ND/2,287,026 (limited data)
2006	ND	ND	ND	ND/5,745,105 (limited data)
2007	1,181,412	113,224	1,294,636	1,294,636/7,546,311=17.15%
2008	794,026	162,257	956,283	956,283/6,662,722=14.35%
2009	475,163	72,841	548,004	548,004/6,232,065=8.80%

Year	Recycled Aggregate	Secondary Aggregate	Totals	As a % of all aggregate materials produced in Kent (primary, secondary and recycled combined)
2010	843,974	59,237	903,211	903,211/5,778,744=15.60%
2011	657,987	51,934	709,921	709,921/5,551,743+12.78%
2012	686,329	88,278	774,607	774,607/5,247,569=14.80%
2013	643,577	24,997	668,574	668,574/4,696,273=14.24%
2014	660,642	81,824	836,462	836,462/ND
Average 2007 to 2014	742,888 0.74 mt	81,824 0.82 mt	836,462 0.84 mt	range 7.6 to 17.15%

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

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

- the sector is quite volatile changing markedly from year to year the only possible 'trend' that can be deduced is that there was a general tendency to increase output till 2007, with a decline since that date.
- the average sales from the 2007 recorded 'high water mark' (of 1.3 mtpa) for the last 7 years has been approximately 0.84 mtpa for the secondary and recycled aggregates combined. Total aggregate sales for this period amount to almost 36 mt, of which 16.29% came from the recycled and secondary sector.

4.2.6 The role of secondary and recycled sources of materials that can give rise to future supply is less certain than primary aggregates, where geological reserves can, with a degree of certainty, be calculated. The construction and demolition cycle is not a definitive or predictable activity and the industrial processes, that can give rise to secondary materials, can similarly vary in response to changing economic circumstances, globally as well as locally. At present it could be reasonably stated (though not reliably statistically tested) that potentially between 10 to 15% (or 4.8 to 7.3 mtpa) of all aggregate need could be supplied by the secondary and recycled aggregates sector in Kent into the future.

4.3 Marine Sources

4.3.1 Aggregates from the sea bed (North Sea and Channel) are an increasingly important resource. The material is derived mainly from the flint content of the Cretaceous Chalk that was eroded by glacial melt water action and deposited on an expansive fluvial continental plain as river channel and outwash fan deposits as the

Pleistocene Epoch Ice Age event came to an end some 10,000 years ago. The resulting sea level rise inundated the continental plain to form the North Sea and the Channel, making these aggregate materials marine in nature today.

4.3.2 These deposits are not being replenished by marine sedimentary system inputs from elsewhere. The Channel and North Sea being defined sedimentary basins and are a significant, but finite, resource similar in that regard to land-won resources. It can reasonably be anticipated that they will be available of the life of the KMWLP (2014-30) 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 their 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 permitted per annum (amount) thus reinforcing the sustainability and long term viability and requirement of marine aggregate wharves in Kent.

4.3.3 The imports into Kent are averaging at some 1.6 mtpa. Table 3 below details the landings in Kent during 2003-2013.

Table 3 Landings of Marine Dredged Sand and Gravel in Kent Wharves 2003-2013 (thousand tonnes per year)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average
1700	1830	ND(1)	1950	1870	1670	1730	1524	1844	2014	1743	1793(2)

1. No data
2. Average between 2006 and 2013 only

4.3.4 The wharves located in Kent (including those within Medway Council's control) have been surveyed for their capacities in 2006 and in 2010; Table 4 below shows the comparative change or stasis between 2006 and 2010 of wharves in Kent.

Table 4 Kent and Medway Wharf Facilities[1]

Site	Operator	Site size 2006 survey	Site size 2010 survey	Change between 2006-10
Ridham Dock	Tarmac PLc	Medium	Large	Increased capacity
Ridham Dock	Brett Aggregates Ltd	Medium	Medium	No change
Johnson's Wharf	Lafarge PLc	Medium	Large	Increased capacity
Robins Wharf	Aggregate Industries PLc	Medium	Medium	No change
Denton Wharf	Clubb Ltd	Large	Major	Increased capacity
Cliffe	Brett Aggregates Ltd	Major	Major	No change
East Quay Whitstable	Brett Aggregates Ltd	Medium	Medium	No change
Eurowharf Frindsbury[2]	Hanson PLc	Large	Major	Increased capacity
Red Lion Wharf	Stema PLC	Large	Major	Increased capacity
Isle of Grain*	Aggregate Industries PLC	Major	Major	No change
Ramsgate New Port	Brett Aggregates Ltd	Small	Small	No change
Robins Wharf Northfleet	Brett Aggregates Ltd	Medium	Large	Increased capacity
42 Wharf (Northfleet)	Lafarge PLC	N/A	Small	New facility (not operational)
Dunkirk Jetty	Brett Aggregates Ltd	Medium	Medium	No change
Sheerness	Aggregate Industries Ltd	N/A	Small	New site (no longer operational as of August 2012)
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. Located in Medway Council's administrative area

4.3.5 The 2010 survey demonstrated that several wharf operators had invested in increasing the capacity (7 out of 16) of their sites since 2006, resulting in an excess of 2 mtpa new importation capacity (estimated). Such that a combined capacity of some 4.65 plus mtpa (estimated) was extant in 2010. The changes included new processing and conveyor plant, as well as 'value addition' facilities such as concrete batching plants. One site (small capacity of up to 0.1 mtpa) ceased operating in 2012.

4.3.6 Moreover, 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. Currently the site is being used in association with the Cross Rail project. Once this discrete use ceases cement and aggregates importation and handling will come on stream giving Kent wharves a total combined capacity in the order of 8 mtpa (estimated).

4.3.7 The 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 breech of the confidentiality so agreed. It can be stated that the existing overall wharf capacity (railhead capacity will be examined under the following import and export balance section) is far greater than the operational throughputs that have been recorded by the annual aggregate monitoring surveys. If increased importation of the both marine and land-won sands and gravels and crushed rock via the area's wharfs (excluding Medway) is required in the future, above the recorded average of 1.8 mtpa average for 2006-13, additional capacity will be available.

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 BGS on behalf of DCLG [3] provides an in-depth understanding of regional and national aggregate sales, inter-regional sales, transportation and consumption of all the primary aggregate streams. Although this survey it is only a 'snap shot' in time, and that Kent and Medway's statistics being combined cannot be seen in isolation, the value of these more in-depth surveys is that they have been conducted at four yearly intervals since 1973. They afford a national and regional examination of long-term trends. The yearly aggregate monitoring has less scope and thus is of more local and regional value. Table 6 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.

5.1.2 Kent and Medway is a net exporter of the land-won sand and gravel aggregate resource, though it is not marked at 8.2%. Most land-won production and other imported material (91.8%) were consumed locally. Marine sands and gravels landed and imported into Kent and Medway show a similar pattern as 86.3% were consumed in the Kent and Medway areas.

5.1.3 For the land-won hard rock there is a marked contrast between the two areas. Medway as it has no hard rock geology so all of the crushed rock recorded is imported, while Kent has substantial land-won resources in addition to that which is also imported. Consumption of this material is proportionally lower than the other primary aggregate resources, recorded as 62%. Significant amounts (38%) were exported onward to other areas, Medway making a marked contribution to the hard rock export pattern.

5.1.4 Of all primary aggregates taken together, Kent and Medway combined were, in 2009, an overall net exporter. Some 8.06 mt was produced and imported, with total consumption being 6.32 mt or 78.4%, leaving 21.6% as exports. This demonstrates that the majority of primary aggregates both produced and imported into the Kent and Medway areas were used within these administrative areas. Table 5 below details the importation, exportation and consumption of aggregates in kent and Medway.

3 Online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6311/1947546.pdf

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

	Land-won Sand and Gravel[1]	Marine-won sands and Gravel [2]	Crushed Rock[3]	All primary aggregates
A. Produced (including landed) in Kent and Medway[4]	1371	3160	3760	8060
B. Exported out of Kent and Medway (A-C)	192	618	1770	2580
C. Apparent consumption in Kent and Medway[5]	1179	2542	1990	5711
D. Imported into Kent and Medway	79	186	340	605
E. Total consumption in Kent and Medway (C+D)	1258	2728	2330	6316
Import (-ve) and export (+ve) balance in tonnes (x 1,000)	+113 8.2% of all material produced was not consumed in the area	+432 13.7% of all material produced was not consumed in the area	+1430 38% of all material produced was not consumed in the area	+1744 21.6% of all material produced was not consumed in the area

1. Minimal land-won sand and gravel production in Medway (9,900 tonnes) for 2009
2. Marine imports were 1.66 mt into Kent and 1.5 mt into Medway in 2009
3. Crushed rock imports and land-won combined were 1.9 mt in Kent and 1.86 mt imports into Medway for 2009
4. Information gathered from AMR and AM sources for both authorities to enable useful comparison to the AM2009 collation figures that combine Kent and Medway together for importation and consumption of primary aggregates
5. Figures from AM2009 collation report

5.1.5 The AM2009 reported the sales destinations of the land-won sand and gravels, crushed rock and the marine sands and gravels for Kent and Medway (though the figures relate to Kent alone on closer examination). Table 6 details the findings.

Table 6 : Primary Land-won and Marine Aggregates destinations When Sold from Kent

	Marine-won Aggregates	Marine-won Aggregates	Land-won Sand and Gravel	Land-won Sand and Gravel	Land-won Crushed Rock	Crushed Rock
Destination	**x1,000 Tonnes**	**%**	**x1,000 Tonnes**	**%**	**x1,000 Tonnes**	**%**
Kent and Medway	**1442**	**86**	**1103**	**81**	**True figure confidential 780 used in lieu of actual production figure(1)**	**86.4**
Rest of South East	**55**	**3**	**75**	**5.5**	**26**	**2.9**
Elsewhere	**171**	**10**	**177**	**13**	**0**	**0**
Unallocated	**0**	**0**	**8**	**>1**	**97**	**10.7**
Total	**1668**		**1362**		**903**	

1. SEEAWP technical Secretary has 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 apportionament"* this figure being 0.78 mt pa

5.1.6 The above data demonstrates that the predominance of Kent's land-won 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 non-land-won imported supply into Kent.

Table 7 Aggregate Railhead Imports and Wharf Landings Combined in Kent

Year	Soft Sands (1)	Sharp Sands and Gravel(2)	Crushed Rock(3)	Secondary Aggregate	Recycled Aggregate	Total
2003	8,685	1,732,535	1,404,980	ND	ND	3,146,200
2004	15,400	1,848,597	1,434,911	ND	ND	3,298,908
2005(4)	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	1,474,689	873,119	ND	ND	2,363,022
Last 3 years average 2011-13	18,078	1,889,468	824,254	ND	ND	2,720,005
Last 7 years average 2006-13	15,312	1,921,121	1,092,960	ND	ND	3,053,628

1. Land-won and marine sources outside Kent
2. Land-won and marine in origin aggregate for use
3. Land-won in origin from outside Kent including that sold for engineering bulk fill purposes
4. Kent and Medway combined data in SEERAWP Annual Report 2005

5.1.7 The data for Table 8 was taken from past AM 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 a rounded figure of some 2.90 mt of primary aggregates was imported into Kent via wharves and railheads. In 2013 the figure dropped to 2.72 Mt. Total aggregate sales in Kent of all types and via all means (including secondary and recycled materials) amounted to 4.4 mt. in 2012 and 4.6 mt. in 2013. Thus imports via wharves and railheads represented some 65%

and 51% of Kent's overall aggregate supply in 2012 and 2013 respectively. Although it is the case that Kent is a limited net exporter of aggregate materials , the role of importation via wharves and railheads in meeting Kent's own needs remains significant.

5.2 Future Import Supply Security into Kent

5.2.1 The reliability of supply from other areas outside Kent has been examined. Although the actual details are confidential the 'spread of data' accrued from talking to other MPAs which export aggregates into Kent and suppliers were informative. Many of these companies own and operate quarries internationally as well as their infrastructure in Kent. Of the international imports materials come from Denmark, France, Ireland, Norway and Netherlands. The majority of these aggregate imports are crushed rock, though land-won sand and gravel is also represented. Of the elements of Norwegian and Danish supply certain reserves are substantial, being in the order of 75 years and 50 years respectively. Not all of the international importers confirmed the permitted life of the supplying quarries.

5.2.2 Internal imports, that meaning those supplies from other parts of the United Kingdom into Kent are again dominated by crushed rock. The material originate from the Cornwall, Scotland, the Mendips (Somerset) and Wales. Many of the respective quarries have planning permissions that stretch into the 2040's.

5.2.3 East Sussex County Council confirmed that land-won sand and gravel extraction at Scotney Court Quarry, Lydd had moved into their area. The original planning permission straddled the administrative areas of both east Sussex and Kent, the majority being in Kent. The aggregate materials have technically become an importation into Kent (where the main market for this site historically has been established). Also some marine dredged sand is leaving East Sussex and being imported into Kent. 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 their available to Kent are in relative abundance. With regard to crushed rock, Kent has an abundance of land-won supply, though this material is supplemented by significant imports to meet the range of technical requirements in the construction world, 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 revised 2009 guidelines were lower. For the South East England Region, the provision indicated was 195 mt of land-won sand and gravel and 25 mt of crushed rock per annum in the period 2005-2020. The RSS apportioned these guidelines sub-regionally; initially both Kent and Medway were combined in Policy M3. The guidelines remain in force at this time though the RSS is now substantially revoked with no mineral policies remaining in force.

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

6.1.3 Consistent with this approach the sub-regional apportionment 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 KCC 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 land-won sand and gravel in Kent has averaged 1.31 mtpa over the last 5 years, and 1.36 mtpa over the past 10 years, see Table 9 (full per year table in Appendix D, Table 26). It is considered likely that the 10-year rolling average figures for land-won sand and gravel in Kent will continue to drop annually into the future with consecutive loss of output post 2011, given that one of Kent's significant sand and gravel quarries has 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 Land-won Sand and Gravel plus Construction Bulk Fill Aggregate and Hoggin Sales 2002-13

Year	Tonnes
Average sales 2011-13 (3 years)	1.06 mtpa
Average sales 2009-13 (5 years)	1.31 mtpa
Average sales 2004-13 (10 years)	1.36 mtpa

6.2.2 If bulk engineering fill aggregates and hoggin are set aside as a more marginal (though not always insignificant) use of resources, a more focused examination of the aggregate use demand can be calculated. Table 10 below shows the average sales data (full per year table in Appendix D, Table 27) in this way, it can be seen that the average sales remain little changed when compared to the figures in Table 9.

Table 10 Kent Land-won Soft and Sharp sand and Gravel Sales 2002-13 (excluding Hoggin and bulk fill aggregate sales)

Year	Tonnes
Average sales 2011-13 (3 years)	1.03 mtpa
Average sales 2009-13 (5 years)	1.30 mtpa
Average sales 2004-13 (10 years)	1.45 mtpa

6.3 Kent Land-won Crushed Rock (Ragstone)

6.3.1 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. Table 11 below details the sales data since 1998 for Kent, a straight 10 year average is not possible given the confidentiality issue. Only two sites operate in Kent as of 2002. As pointed out in Table 7 the Technical Secretary of SEEWAP

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.

Table 11 Kent Land-won Crushed Rock sales 1998-2013(1)

Year	Thousand Tonnes
1998	700
1999	700
2000	954
2001	1,240 (figure rounded to preserve confidentiality)
2002 through to 2013	**C**
Average 2002-13	**C** a working figure being 0.78 mtpa is being advocated for plan monitoring purposes

1. **C** denotes confidentiality agreement restricted data

6.3.2 In the absence of a 10 year average, the 0.78 mtpa RSS apportionment figure will act as a substitute for LAA purposes.

6.4 Past Land-won Aggregate Sales Data for Kent

6.4.1 Table 12 details all sands and gravels from the land-won resource. This can be broken down further into soft or building sands and sharp sands and gravels. These aggregates have different markets: soft sands are used in mortar and asphalts and sharp sands and gravel in concrete. Table 12 (full yearly sales details are to be found in appendix D Table 30) below shows the sales data for sharp sands and gravels. There are significant reductions since 2010 that are anticipated to continue given the 'loss' of production output in Kent to East Sussex at Scotney Court Quarry, Lydd as the quarry's operational area has crossed the administrative boundary.

Table 12 Kent land-won Sharp Sand and Gravel Sales 2002-13

Year	Tonnes
Average sales 2011-13 (3 years)	0.62 mtpa
Average sales 2009-13 (5 years)	0.67 mtpa
Average sales 2004-13 (10 years)	0.81 mtpa

6.4.2 The 10 year rolling average is presently at 0.81 mt and is anticipated to decline through time, given that the last three years average sales indicates a potential trend of continued reduced output (at 0.62 mt).

6.4.3 Table 13 below (full per year sales details are to be found in appendix D Table 28) shows the sales data from AM surveys for Kent's soft sands.

Table 13 Kent Land-won Soft Sand sales 2002-13

Year	Tonnes
Average sales 2011-13 (3 years)	0.37 mtpa
Average sales 2009-13 (5 years)	0.59 mtpa
Average sales 2004-13 (10 years)	0.63 mtpa

6.4.4 The rolling 10 year sales average at 0.63 mt for soft sands may not be very representative of the way the soft sand market is changing, both the five and three year sales averages show declines, and in recent years more markedly than the observed declines of the sharp sands and gravels sales.

7 Assessment of Permitted Reserves in Kent

7.1 Assessment of Permitted Reserves in Kent

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

7.1.2 Permitted reserves can include dormant and currently non-working sites; inactive and dormant sites that are agreed by the industry as unlikely to ever be worked again are to be excluded from landbank calculations for the present. Table 16 below details the extent of Kent's landbank of permitted aggregate reserves in the AM2013 survey data, which records data of the previous 12 months sales and the reserves as of the end of that year. Table 14 below Kent's permitted reserves in 2013.

Table 14 Permitted Reserves: Construction Aggregates as End of 2013

Type	Total Permitted Reserves (mt)
Sharp Sand and Gravel (including sandstone gravels)	3.61
Sand and Gravel or Hoggin[(1)] For use as construction bulk fill	0.50
Soft Sands	14.44
Hard Crushed Rock (Ragstone)	Current reserves confidential though estimated to be in the region of 40-50 mt

1. the reference to Hoggin is a compactable groundcover that is composed of a mixture clay, sand and gravel. It is an engineering grade mineral often used for bulk fill, and i unsuitable for other applications without extensive processing

8 Kent Landbank Calculations

8.1 Kent Sharp Sands and Gravels

8.1.1 When both soft sands and sharp sands and gravels are combined, the overall permitted sand and gravel reserves in Kent are substantial. If considered in this way permitted reserves amount to 18.53 mt (as of the end of 2013). A simple landbank calculation gives nearly 13 years of reserves, some 6 years greater than the 7 years landbank required by the NPPF, but not a maintained rolling 7 year landbank. Table 15 below details these calculations:

Table 15 Sharp and Soft Sands and Gravel Combined Landbank in Kent 2013

10 Year Sales Average 2014-13 (A)	1.45 mtpa
Permitted Reserves as End of 2013 (B)	18.53 mt
Current Landbank Duration (B divided by A)	12.78 years
Maintained Landbank Required by NPPF (1.45 mtpa for 7 years)	10.15 mtpa

8.1.2 The two geologies can be seen as distinct. Soft sands are a sequential unit (the Folkestone Beds) of Kent's stratigraphy with more than a superficial occurrence. They form an important part of the county's geological structure. The sharp sands and gravels have a superficial occurrence in that they are surface deposits of geologically recent processes and have significantly different characteristics to soft sands. As a result of their inherent differences they serve essentially different markets (i.e mortar and concrete products). The national and regional aggregate guidelines do not differentiate between the different types of sand and gravel.

8.1.3 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."

8.1.4 The previous Kent LAA in 2012 did not differentiate between the sand and gravels available in Kent. As the national and regional guidelines and the NPPF do not differentiate between the different types of sands and gravel.

8.1.5 In this second Kent LAA both a separate and a combined soft and sharp sands and gravels landbank will be compared and contrasted to gain a full understanding of the supply implications when considering landbank calculations. The current simple landbank position with regard to the sharp sands and gravel in Kent is shown in Table 16 below:

Table 16 Kent's Sharp Sands and Gravel Landbank in 2013

10 Year Sales Average 2014-13 (A)	0.810 mtpa
Permitted Reserves as End of 2013 (B)	3.61 mt
Current Landbank Duration (B divided by A)	4.45 years
Maintained Landbank Required by NPPF (0.810 mtpa for 7 years)	5.67 mtpa

8.1.6 Kent's reserves of sharp sands and gravels fall short of providing a 7 year land-bank.

8.2 Kent Soft Sands

8.2.1 Table 17 below demonstrates that there is a relative abundance of reserves for softs and well in excess of the landbank requirements based on the 10 year rolling sales average for this mineral.

Table 17 Soft Sands Landbank in Kent 2013

10 Year Sales Average 2004-2013 (A)	0.63 mtpa
Permitted Reserves as End of 2012 (B)	14.44 mt
Current Landbank Duration (B divided by A)	22.9 years
Maintained Landbank Required by NPPF (0.63 mtpa for 7 years)	4.41 mtpa

8.2.2 The current landbank of soft sands is more than five times that needed for a 7 year landbank.

8.3 Kent Crushed Hard Rock

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

8.3.2 It is quite clear from Table 18 that Kent has a significant landbank of reserves that can be projected well past the anticipated relevant plan's time span of 2030. The landbank required to be maintained throughout a plan for crushed rock is 10 years, available reserves surpass this by at least 40 years.

Table 18 Hard Rock (Ragstone) Landbank in Kent 2012-13

10 Year Sales Average 2004-2013 (A)	0.78 mtpa
Permitted Reserves (B) as End of 2012	Actual figure is confidential though estimated at 40-50 mt[(1)]
Current Landbank (B/A) Duration	51-64 years
Maintained Landbank Required by NPPF (0.78 mtpa for 10 years)	7.8 mtpa

1. Including recent 2013 planning permission for 16.67 mt

8.3.3 The hard rock reserves in Kent are demonstrably substantial, and the recent planning permission granted in 2014 for 16.67 mt at Hermitage Quarry essentially secures a supply of high grade crushed rock in excess of the NPPF maintained landbank requirements alone.

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 a decline recently in sales of sands and gravels. From a high of 1.2 mt in 2009 to 0.4 mt in 2012 for soft sands and from a high of 1.17 mt in 2005 to 0.65 mt in 2012 for sharp sands and gravels. The reasons for the decline may be associated with the recessional event since 2008 and a number of other factors. This may be such matters as a reduction in the intensity of aggregate use in construction design and greater use of alternatives to land-won aggregates from the recycled and secondary aggregate sector (in Kent this has grown from 0.475 mt in 2003 to 0.77 mt in 2012). The quantitative demand for land-won aggregates in Kent will be a function of the construction and maintenance activity over the coming years, as well as other influences, such as materials substitution and lowered intensity of use by design.

9.1.2 While it will not be possible to predict how the intensity of aggregate use in design will change, and the ultimate degree of primary aggregate substitution that will affect demand, it is the 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. This would reflect Kent's anticipated circumstances looking forward, such that it can be compared to average past sales approach to gain a more rounded appreciation of potential demand.

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

Housing Construction

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

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

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

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

- Housing Delivery Kent 2006-12 (6 years); 37,302 completions or 6,217 per annum
- Housing Projections Kent 2011-31(20 years); 132,357 projected, or 6,618 per annum

9.2.4 The application of the assumed 60 tonnes per house consumption means that for the housing sector 39,7080 tonnes are required per annum. Giving a total of 7,941,600 tonnes in total between 2011 to 2031 are necessary to provide for the Kent (excluding Medway)wide projected housing growth.

Education Infrastructure

9.2.5 KCC has a statutory responsibility to provide the county's educational infrastructure, namely new and expanded schools. For the period 2013-31 the total projected cost is estimated to be some £441.3 million. 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, as of 2010:

- sand and gravel approx. 0.5 tonnes per £1,000 of construction output
- crushed rock approx. 0.75 tonnes per £1,000 of construction output
- total aggregates approx. 1.40 tonnes per £1,000 of construction output

9.2.6 Using the BGS data on the intensity of aggregate construction usage requirements as follows:

- use intensity of sand and gravel 220,700 tonnes
- use intensity of crushed rock tonnes 331,050 tonnes
- use intensity of total aggregates tonnes 617,960 tonnes

9.2.7 It could be the case that in Kent the education sector may require up to 600,000 tonnes of aggregates between 2014 and 31

Major Projects (non-infrastructure) - Paramount Park

9.2.8 A non-infrastructural major project that may occur over the plan period is the 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 the requirements of this project are as follows:

- use intensity of sand and gravel 1,000,000 tonnes

- use intensity of crushed rock 1,500,000 tonnes
- use intensity of total aggregates 2,800,000 tonnes

9.2.9 In terms of new highway infrastructure over the plan period that has the potential to require significant volumes of aggregates is the Lower Thames Crossing 2025 or earlier (cost range £1.2 to £3.2 billion dependant on final option choice). Applying the data prepared by BGS the aggregate requirements are as follows:

9.2.10 Major Projects (Infrastructure) - Lower Thames Crossing

- use intensity of sand and gravel 750,000 to 1,600,000 tonnes
- use intensity of crushed rock 900,000 to 2,400,000 tonnes
- use intensity of total aggregates 1,680,000 to 4,480,000 tonnes

9.2.11 Given that the Lower Thames Crossing may well have a greater degree of structural concrete work it may be prudent to conclude that it would require more crushed rock than sand and gravel, so requirements will potentially be in the range of 0.9 to 2.4 mt of materials. In terms of the anticipated major projects in Kent the total requirements could rang between 4.48 mt to 7.28 mt overall.

Highways Infrastructure

9.2.12 The total identified highway scheme build for the period 2015-21 in Kent (excluding Medway), has a cost of £631.40 million. The situation may be more complex with the programed Kent road construction that would use a wide variety of aggregates, soft sands as well as crushed rock for asphalt coated stone product applications such as base courses of macadam and wearing courses. Sub-bases are generally crushed rock., sand and gravel use in concrete occurs as well.

9.2.13 Another significant scheme, the proposed dualling of the A21 between Tonbridge to Pembry, was considered by the Secretaries of State in May 2014, following an earlier public enquiry. It was concluded that the road scheme should proceed, the route chosen, the Published Scheme at a cost of £104.1 m. 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 315,700 tonnes
- use intensity of crushed rock 473,550 tonnes
- use intensity of total aggregates 883,960 tonnes

9.2.14 Thus it would appear prudent to apply the total aggregates intensity of use assumption for general road construction of 0.88 mt.

Infrastructure Maintenance

9.2.15 Maintenance spend on Kent's highway infrastructure is an on-going yearly process. Currently the amount of money spent was (April 2013 – March 2014) £53.9 million. 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, a highway maintenance expenditure

of £39 million on matters requiring aggregates in various forms was achieved. The highway re-surfacing expenditure for the same period was £5.8 million giving a total of £44.8 million for highway maintenance of over the financial year. This work will absorb a range of aggregate types, so it may be reasonable to use the 1.4 tonnes of aggregate per £1,000 of construction output (the BGS assumption) in calculating the overall required quantities. Giving 0.63 mt for the financial year period.

9.2.16 Over the life of the anticipated Kent Waste and Minerals Local Plan (the following broad aggregate requirements can be predicted in Kent:

- House Building - 6,618 new units per annum would require 7,941,600 tonnes aggregate for the period 2011 to 2030. The plan period is to be 2013-30 so the plan requirement is 6,750,360 tonnes.
- Education Infrastructure - Educational requirements are estimated to be between 2 - 300,000 tonnes between 2014 and 2031.
- Major Projects (Lower Thames Crossing and Paramount Park) -The project has a projected range of 2.4 to 3.9 mt of aggregate requirement during the plan period 2013-30
- Highways Infrastructure - The Kent general road construction programme during the plan period would require in the order of 0.88 mt of aggregates.
- Highways Infrastructure Maintenance - Currently 0.63 mt are required for the financial year, for the plan period 2013-30 approximately 10.71 mt of aggregates may be required.

9.2.17 Over the plan period a minimum of 20.89 to 22.54 mt of aggregates of various kinds will be required. The NPPF's online Planning Practice Guidance does not indicate over what time span a forecast of aggregate demand should be made. The life of the anticipated Plan is an extended forecast, which may well be unrealistic given that the characteristics of the economic cycles may well change in the future compared to those that generated past sales averages data. A 7 year forecast, the same length as that of the maintained landbank for sands and gravels (though 'maintained' means a 7 year land-bank being in existence in any one year) may be more realistic.

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

- Approximately 6,618 new housing units per annum, totalling 46,326 for 7 years.
- £441.4 million on educational infrastructure, this being new schools and extensions to existing to support new housing, to be delivered 2014-31. For the period of the next 7 years till 2021, the predicted spend is £340.2 million, this would equate to 170,100 tonnes of sand and gravel, assuming crushed rock would not figure significantly in this area of construction.
- Paramount Park constructed by 2018/19 cost £2 billion.

- Total identified highway scheme build in Kent (excluding Medway), at a cost of £631.40 million for the period 2015-21.
- A21 dualling Tonbridge to Pembry cost £104 million.
- Seven years of highway infrastructure maintenance costs of £0.63 million.

9.2.19 Then the required aggregate supply breakdown can be attempted:

9.2.20 **House Building** - The application of the assumed 60 tonnes per house consumption means that for the housing sector 397,080 tonnes are required per annum giving 2,779,560 tonnes between 2014 and 2021.

- **Education Infrastructure** - Some £441.4 is to be spent on educational requirements, to deliver new and expanded schools. It is considered that if the economic ratio of approx. 0.5 tonnes of sand and gravel per £1,000 of construction output is used an estimated 2 - 300,000 tonnes between 2014 and 2031 will be required.
- **Major Projects** (Paramount Park) - Given that it is reasonable to assume that the majority of aggregate use would be directed towards crushed rock for concrete manufacture the project may consume approximately 1.5 mt of aggregate materials, based on an intensity of 1.4 tonnes of aggregate use (for crushed rock) per £1,000 of construction cost.
- **Highways Infrastructure** - The Kent general road construction programme including the A21 dualling (excluding Medway) at a cost of £735.40 million is for the period 2015-21. This would require in the order of 0.88 mt of aggregates.
- **Highways Infrastructure Maintenance** - Currently 0.63 million tonnes are required for the financial year, for the period 2014-21 approximately 4.41 mt of aggregates may be required.

9.2.21 The amount of aggregate material, that may be required over the next seven years, may well be in the region of 9.73 mt, of which, at least 1.5 mt may might be crushed rock. When compared to the 10 year rolling sales averages for the main landwon aggregate types the figure generated by taking local circumstances as the proxy for aggregate demand prediction is low. Table 19 below demonstrates the difference between the two approaches.

Table 19 Comparison between the 10 Year Rolling Averages and Local Circumstances Estimated Demand for the Next 7 Years 2014-21(1)

Aggregate Type	10 Year rolling average sales figure for 7 years (A)	Local Circumstances Demand Estimate (B)	Percentage of (B) from (A)
Crushed Rock	5.46 mt	1.5 mt	27.5%
Soft Sand	4.41 mt	8.23 mt(2)	56.5%
Sharp Sand and Gravel	10.15 mt		
Totals	20.02 mt	9.73 mt	48.6%

1. sharp sand and gravels and soft sands are not readily distinguishable
2. Sharp sand and gravels and soft sands are not readily distinguishable.

9.2.22 The activities of the general community and small to medium construction firms are also consuming aggregates from retail and trade outlets and are not taken into account due to modelling difficulties as a consequence of a lack of readily available data. Though it unlikely that this explains the observed difference between the 10 year rolling sales averages projected over 7 years and the local circumstances derived prediction of aggregate demand. The modelled demand is 51.4% less than the average sales derived data. It may be the case that the average sales derived data does indeed accurately reflect the un-modelled element of local demand and the local circumstances demand prediction is not historically exceptional in demand terms in any event.

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 role of the County Council. The KCC has started the process of identifying appropriate sites where minerals may be extracted in an environmentally acceptably manner. The sites were initially identified by a 'Call for Sites' exercise in 2010 and 2011, where landowners or their agents and operators came forward with potential sites for mineral extraction, processing and importation of a range of aggregates including soft sand, sharp sand and gravel and crushed rock (including secondary and recycled aggregates). These sites were considered for inclusion in a Kent Mineral Sites Plan. A series of public consultations culminated in May 2012 with a Mineral Sites Preferred Options consultation. The preferred options for consideration were selected to provide the necessary provision for each type of mineral type 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). The document will be reviewed in the future for the sand and gravel elements. For crushed rock there is a demonstrable surplus of permitted reserves that will which will last beyond the end of the Plan period (2030).

10.0.2 With regard to the land-won soft sand landbank the calculations in section 8.2.1 demonstrate that reserves are extensive. Several further soft sand sites were proposed by operators for consideration as part of the Mineral Sites Plan's 'Call for Sites', they were:

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

10.0.3 The total potential new reserves amount to an estimated 16.422 mt. If these reserves were come forward they would enable a maintained 7 year landbank to be perpetuated well past 2030 and there would still be a sizable landbank reserves at 2040 (some 10.730 mt). The potential future replenishment of the soft sands landbank in Kent does not appear to be at the point where a steady and sustainable supply of

this aggregate type would be in any way uncertain. Table 21 below shows the soft sands land-bank projections with replenishing reserves modelled as coming on stream at the beginning of the plan period.

Table 20 Landbank Calculations for land-won Soft sands with Preferred Sites Options Included

Year	Permitted Reserves with additional Preferred Options Reserves mt	10 Year Sales Average Draw Down Figure mt	Remaining Reserves End of Year mt	Cumulative Further Reserve Requirements for a maintained 7 year landbank mt
2013	31.142	0.756	30.386	0
2020 (plus 7 years on)	25.850	0.756	25.094	0
2030 (end of Plan period)	18.290	0.756	17.534	0

10.0.4 The future supply situation with regard to the sharp sands and gravels is a marked under supply of permitted reserves to meet the 7 year land-bank requirement. The sharp sand and gravel land bank calculations in section 8.1.1 demonstrate that a marked under supply currently exists, a 7 year landbank is not being provided.

10.0.5 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 Dungeness).

10.0.6 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.

10.0.7 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.

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

- Arnolds Lodge Farm West, East Peckham, Tonbridge and Malling, estimated resource 200,000 tonnes
- Woodfall's Farm, Yalding, Maidstone, estimated resource 1,500,000 tonnes
- Filston Lane, Shoreham, Sevenoaks, estimated resource 600,000 tonnes
- Ham Farm, Faversham, Swale, estimated resource 1 million tonnes
- Lydd Quarry, Allens Bank Quarry extension, Lydd, Shepway, estimated resource 0.3 million tonnes

10.0.9 The sites are shown in Appendix B in more detail as site plans, the nature of the potential reserves and the reasons for exclusion. The total loss of potential reserves due to limited economic viability, operational difficulties and environmental constraints amount to an estimated 6.45 mt. In contrast those sites that have been identified as having the potential to replenish the sharp sand and gravel land-bank during the plan period 2013-30 are detailed in the same document. They are:

- Beltring Green Farm, East Peckham estimated resource of 300,000 tonnes.
- Moat Farm, Capel estimated resource of 1.5 mt.
- Land North and South of Hammer Dyke, Capel estimated resource of 1- 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.

10.0.10 Additional permitted reserves of between 5.47-7.47 mt could potentially come from these sites, which are identified as acceptable preferred options during the plan period. Being sharp sand and gravel in type the impact on the current sharp sands and gravel land-bank calculation is shown in Table 21 below.

Table 21 Sharp Sands and Gravel landbank in Kent Current reserves Plus Potential New Reserves of 5.47- 7.47 mt

Year	Permitted Reserves with additional Preferred Option Sites Reserves mt	10 Year Sales Average Draw Down Figure mt	Remaining Reserves End of Year mt	Cumulative Further Reserve Requirements required to maintain a 7 year land-bank mt
2013	9.24 to 11.24 mt	0.948 mt	8.292 to 10.292 mt	0
2020 (plus 7 years on)	1.66 to 3.66 mt	0.948 mt	0.708 to 2.708 mt	0 to 3.928 mt
2030 (end of Plan period)	-17.30 to -15.30 mt	0.948 mt	-16.35 to -16.25 mt	22.99 to 22.89 mt

10.0.11 If, theoretically, 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 sharp sands and gravel landbank of 7 years in Kent throughout the life of the anticipated Plan 2013-30. This is illustrated by Table 29 in Appendix D.

10.0.12 In the above scenario there ceases to be a 7 year landbank in 2017 and reserves exhaust in 2024 if no further reserves (that are as of this time unknown in terms of their full potential) were to come on stream. If all types of sand and gravel are included as one landbank and all potential new reserves are secured theoretically early on in the plan life there would be a 7 year landbank for nearly all the plan period.

10.0.13 As in common with all modelled scenarios, the underlying assumptions can be unrealistic. The above scenarios (fully detailed as Tables 29, 31 and 32 in Appendix D) are all predicated by a 10 year average of the recorded sales figures (though crushed rock is estimated only for confidentiality reasons). Government guidance allows for 'other relevant local information', including the last 3 years sales averages, if they demonstrate any marked change in the pattern of supply.

10.0.14 Further analysis of more recent sales averages shows a corresponding lowering of the average quantities for the sands and gravels sales of both types, this has the effect of a lower draw down figure (based on an average of sales for the last

3 years) for all sands and gravels on a 42.20 mt landbank scenario. made up of all permitted reserves of both types of sands and gravels, plus 7.74 mt of sharp sands and gravels and 16.422 mt of additional soft sands as new reserves secured early on in the plan period (see Table 32 Appendix D for a full per year breakdown over the Plan period 2013-30).

Table 22 Landbank Calculations for All Land-won Sand and Gravels for Current Permitted Reserves (2014) with a Potential Total of 7.46 mt of Additional Sharp Sands and Gravel and 16.422 mt of Additional Soft Sand Reserves Secured (Preferred Option Consultation May 2012 Sites)

Year	Permitted Reserves at Start of Year (18.50 mt plus additional reserves of 7.47 secured mt and an additional 16.422 mt with a total potential reserve 42.40 mt)	Draw Down During Year (mt) as per the 3 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 8.12 mt (in any one year)
2013	42.40	1.16	41.43	0
2020 (plus 7 years	34.38	1.16	33.22	0
2030 (end of Plan period)	22.78	1.16	21.62	0

10.0.15 The reduced 3 year average sales figure correspondingly reduces the maintained 7 year landbank from 11.9 to 8.12 mt of required reserves in any one year. This, together with the reduced yearly draw down figure of 1.16 rather than 1.70 million tonnes per year would give a maintained landbank well past the anticipated plan life of 2030.

11 Conclusion

11.0.1 The existing permitted landbank for the three main landwon aggregate mineral types in Kent is highly variable.

- the soft sands permitted landbank, as of the end of 2013, was 14.72 mt. This would maintain a 7 year landbank of 5.3 mt (or more) of permitted reserves in any one year, with an extraction rate equal to the 10 year average sales figure of 0.756 mt, until 2023.

- the sharp sands and gravel landbank, as of the end of 2013, was 3.77 mt. This does not give a simple 7 year landbank for Kent at this time. Given the current permitted reserves of only 3.77 mt an additional 3.814 mt is required to give the simple 7 year landbank, and this would be depleted at an anticipated rate of 0.948 mtpa based on the last 10 year sales averages. To maintain a 7 year landbank would require significant amounts of new permitted reserves of the material to come forward immediately.

- the hard rock permitted landbank, as of the end of 2013 was 49.325 mt. This would maintain a 10 year landbank of 7.8 mt (or more) of permitted reserves in any one year, with an extraction rate equal to the 10 year average sales figure of 0.78 mt, into well past 2030.

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

"Where there is a distinct market for a specific type or quality of aggregate such as high specification rock, asphalting sand, building sand or concreting sand, a separate landbank based on provision to that market may be justified for that material or those materials"

11.0.3 Crushed hard rock, the Ragstone, has a distinct market, and as such should be a separate landbank consideration than the sands and gravels in Kent, also the need to maintain a 10 year landbank in effect separates them in any event from the sands and gravels.

11.0.4 The soft sands reserves in Kent are considerable and can be said to serve a distinct market as an aggregate for mortar and asphalt production, a 7 year landbank exists in the county at this time and will remain untill at least 2022 given the 10 years average sales data rate of extraction. The sharp sands and gravels in Kent are in decline as a landwon resource, this is understood. Their occurrence is now too limited and constrained to realistically deliver and maintain a 7 year landbank based on the last 10 years sales averages.

11.0.5 It is concluded that if the potentially acceptable and deliverable new permitted reserves of some 7.47 mt (the maximum) were to come forward early in the anticipated plan period, this would deliver a maintained 7 year sharp sands and gravel landbank till 2016 based on the last 10 year average sales draw down rate of 0.948 mtpa. Beyond that date permitted reserves fall below the maintained 7 year landbank requirement and a projected exhaustion point occurs in a 2024/5.

11.0.6 The evidence within this LAA shows that there is abundant crushed rock and soft sands in Kent, as both permitted reserves and potential new reserves. Taken together these are sufficient to secure a steady supply of aggregates to the market in a sustainable fashion. The same is not the case with the sharp sands and gravels from the land. This is a rapidly depleting resource as the existing permitted reserves and the potential new sustainable and deliverable reserve replenishments are limited. Though if they were to come forward in a timely fashion the latter could meet the NPPF requirement of a maintained 7 year landbank for sharp sands and gravel until 2016, while the Plan period is till 2030. It is clear that the shortfall will have to be offset by the use of imported materials and contributions from substitute and recycled aggregates to fill the overall supply gap into the future.

11.0.7 The data from the AM2009 survey showed that Kent and Medway (the two areas were not disaggregated) was a net exporter of aggregate materials, though most of the materials produced and handled (imported) was consumed within Kent. Most land-won sand and gravel was consumed, only some 8% was exported, of marine sands and gravels only some 13.7% was exported. Crushed rock had the lowest 'home' consumption, as 38% was exported to other areas in the South East and beyond (Medway's data no doubt affects this observation given that typically 1 to 1.5 mt of crushed rock is imported into the unitary area and little of it is consumed within its administrative boundaries, the high specification granite is used in a variety of construction applications elsewhere).

11.0.8 The AM2009 survey is a detailed 'snapshot' in time. However, it does illustrate the importance of aggregates to the Kent and Medway economies given their generally high consumption within the county. The role of imports via wharves and railheads in overall supply is significant. The average per annum imports via wharves and railheads in Kent for the period 2006-13 is some 2.70 mtpa. Crushed rock made up 1.1 mtpa and sharp sands and gravels (both landwon and marine dredged) 1.6 mtpa of this average rate of importation. The permitted current importation capacity across Kent's wharves is an estimated 8 mtpa, though some of this is not yet implemented. It is clear there is great scope for enhanced importation into the future.

11.0.9 It is clear that there is a predicable shortage in supply of the land-won sharp or flint sands and gravels over the anticipated Plan period. Suitable alternatives in supply are available to address the anticipated shortfall. These will very likely be in the form of increased imports into Kent of land-won sand and gravels from other areas together with marine dredged sands and gravels plus an on-going contribution from the secondary and recycled aggregate sources. The latter making a current contribution of approaching a level approaching a million tonnes per annum.

11.0.10 While it can be stated that there is a current underutilisation of permitted importation capacity, this will be undoubtedly be increasingly taken up as the depletion of Kent's land-won sharp sands and gravels progressively reduces supply to market. It is the case that the National and Regional Guidelines for Aggregates Provision in England 2005-2020 provide an indication of the total amount of aggregate provision that the MPAs (collectively) should aim to provide, notwithstanding this, if robust local evidence demonstrates that they can be exceeded or cannot be met in full this is an acceptable position. Kent's position is robustly evidenced and is in accordance with the national guidelines in that land-won supply of sharp sands and gravel will have to be supplemented progressively though time with increased imports. The on-going safeguarding of Kent's wharves and railheads, as well as ensuring that sufficient sites are available for aggregate recycling, will be imperative to the securing of Kent's sustainable aggregate supply to meet the varying needs of the construction market into the future.

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

The most up to date list of aggregate quarries in Kent is given in the SEEAWP 13/10 (November 2013). The list below in Table 29 is taken from that document.

Table 23 Active and Inactive Sand and Gravel and Ragstone Quarries in Kent

Quarry	Operator	Aggregate Type
Borough Green Sand Pits	Borough Green Sand Pits Ltd	Soft Sand
Charing Quarry	Brett Aggregates Ltd	Soft Sand
Faversham Quarry	Brett Aggregates Ltd	Sand and Gravel
Highstead Quarry	Brett Aggregates Ltd	Sand and Gravel
Lydd Quarry (Scotney Court Farm)	Brett Aggregates Ltd	Sand and Gravel
Greatness Farm (Sevenoaks Quarry)	Tarmac Ltd	Soft Sand
Shepard's Farm Quarry	Brett Aggregates Ltd	Sand and Gravel
Wrotham Quarry (Addington Sand Pit)	Hanson Aggregates	Soft Sands and Silts
Denge Quarry	CEMEX UK	Sand and Gravel
Sqeurreys Sand Pit, Westerham	Monier	Sand and Gravel
Igtham Sand Pit	H&H Celcon Ltd	Soft Sand
Darenth and Joyce Green, Dartford	J Clubb Ltd	Sand and Gravel
East Peckham Quarry	J Clubb Ltd	Sand and Gravel
Nepicar Sand Quarry	J Clubb Ltd	Soft Sand
Hermitage Quarry, Maidstone	Gallagher Aggregates	Crushed Rock Ragstone
Blaise Farm, West Malling	Hanson Aggregates	Crushed Rock Ragstone
Allens Bank	*Brett Aggregates Ltd*	*Sand and Gravel*
Conningbrook Quarry, Ashford	*Brett Aggregates Ltd*	*Sand and Gravel*

Quarry	Operator	Aggregate Type
Aylesford Quarry, Aylesford	*CEMEX UK*	*Soft Sands and Silts*
Joyce Green Quarry	*Hanson (Joyce Green Aggregates)*	*Soft Sand and Sand and Gravel*
Stone Castle Farm, nr Tonbridge	*Lafarge Aggregates*	*Sand and Gravel*
Ham Hill Sand Pit (Snodland Quarry)	*Tarmac Ltd*	*Soft Sand*

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

Sharp sands and gravel sites put forward for the Kent Minerals and Waste Development Framework, Mineral Sites Plan, Preferred Options Consultation, May 2012 and the environmental constraints and other material considerations leading to their rejection.

Table 24

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

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

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 Councils 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 201

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, are 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[(4)]. 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 (n the South England Regional Spatial Strategy 2009, to 1.6mtpa.

4.3 Essex County Council has based plan provision on the basis of the agreed apportionments previously set out in the now revoked East of England Regional Spatial Strategy (draft 2010) as it provides greater certainty to both plan makers and the minerals industry, whilst also providing the flexibility to adapt to changing demands by allowing for a measure of flexibility and contingency. The adoption of a plan provision based on a rolling average of ten year sales by Kent County Council is still considered to allow for compatibility between the two mineral plans. The difference in Kent County plan 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 due to the lack of suitable sites submitted for consideration for extraction in the south, 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. Whilst it is the intention of Kent County Council to safeguard these wharves to ensure their future use, there are potential issues to be worked through with their respective local planning authorities.

4 1 and as further apportioned in the draft East of England Regional Spatial Strategy 2010 as Policy M1

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 a revision of mineral provision beyond that set out in paragraph 4.2 may have implications for our respective authorities.

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 meting 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.

Agreed

Appendix D: Aggregate Landbank Calculation Tables by Year

D.1 Calculation details of aggregate resources.

Table 25 Capacity of Recycled/Secondary Aggregate Production in Kent February to March 2013 Quantities in unless otherwise stated, (1)

District and Locality	A	B	C	D	E	F	G	H
Ashford								
Conningbrook Quarry	LD	LD	175,000	40,000	No			#
Sevington	LD	LD	LD	0	No	#		
Hothfield	LD	LD		10,000	No	#		#
Canterbury								
Shelford Landfill	490	LD		25,000	No			#
Dartford								
Old Rochester Road	800	240,000		240,000	No	#		
Pinden Quarry	LD	LD		77,000	Yes		# Active consent until 2042	
Swanscombe	LD	LD	50,000	0	Yes			
Dover								
Richborough Hall	LD	LD		102,000	No			
Pike Road	LD	LD		10,000	No			

District and Locality	A	B	C	D	E	F	G	H
Maidstone								
Allington Quarry	LD	500,000	500,000	60,000	No	#		
Thanet								
Ramesgate New Port	LD	0		0	No	#		
Stonelees	LD	LD		0	No			#
Tonbridge and Malling								
Hermitage Quarry	LD	LD	585,000	530,000	No		# Until reserves exhaust	
Platt Quarry	LD	LD		8,000	No			
Borough Green Landfill	LD	LD		0	No			#
East Peckham	LD	LD		LD	No			#
Ham Hill	LD	LD		LD	No	#		
Swale								
Faversham Quarry	LD	175,000	175,000	9,600	No		# Until reserves exhaust	
Ridham Dock	LD	100,000		60,000	No	#		

District and Locality	A	B	C	D	E	F	G	H
Ridham Dock Road	LD	LD		0	No	No longer operational		
Ridham Dock Complex	LD	50,000	LD	LD	no	#		
Unit 34 Queenborough	LD	150,000	100,000	70,000	Yes	#		
Sevenoaks								
Greatness Quarry	LD	LD		3,000	No		# Until restoration completed	
Totals		1.215 mt^ plus	1.135 mt^ plus	1.245 mt^		9*	4*	6*

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

Table 26 Kent all Land-won sand and Gravel plus Construction Bulk Fill Aggregate and Hoggin Sales 2002-13

Year	Tonnes
2002	1,689,480
2003	1,868,585
2004	1,719,321
2005	1,711,600
2006	1,692,446
2007	1,823,149

Year	Tonnes
2008	1,595,258
2009	2,006,198
2010	1,389,299
2011	1,068,523
2012	1,040,259
2013	1,066,597
Average sales 2011-13 (3 years)	1.06 mtpa
Average sales 2009-13 (5 years)	1.31 mtpa
Average sales 2004-13 (10 years)	1.36 mtpa

Table 27 Kent Land-won Soft and Sharp sand and Gravel Sales 2002-13 (excluding Hoggin and bulk fill aggregate sales)

Year	Tonnes
2002	1,660,501
2003	1,839,601
2004	1,687,425
2005	1,712,000
2006	1,381,789
2007	1,759,369
2008	1,582,798
2009	1,935,552
2010	1,385,497
2011	1,058,754
2012	1,040,031
2013	1,006,597
Average sales 2011-13 (3 years)	1.03 mtpa
Average sales 2009-13 (5 years)	1.30 mtpa

Year	Tonnes
Average sales 2004-13 (10 years)	1.45 mtpa

Table 28 :Kent Land-won Soft Sand sales 2002-13

Year	Tonnes
2002	815,228
2003	720,562
2004	779,483
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	304,536
Average sales 2011-13 (3 years)	0.37 mtpa
Average sales 2009-13 (5 years)	0.59 mtpa
Average sales 2004-13 (10 years)	0.63 mtpa

Table 29 Landbank Calculations for Land-won Sharp Sands and Gravels for Permitted Reserves (as of 2013) and a Potential Total of 7.47 mt of New Reserves Secured (Preferred Options Consultation Sites)

Year	Permitted Reserves at Start of Year 3.77 additional reserves of 7.47 secured (mt) giving a total of 11.24 mt as end of 2013 and beginning of 2014	Draw Down During Year (mt) as per the 10 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 6.64mt
2013	11.240	0.948	10.292	0
2014	10.292	0.948	9.344	0
2015	9.344	0.948	8.396	0
2016	8.396	0.948	7.448	0
2017	7.448	0.948	6.500	0.14
2018	6.500	0.948	5.552	1.088
2019	5.552	0.948	4.604	2.036
2020	4.604	0.948	3.656	2.984
2021	3.656	0.948	2.708	3.932
2022	2.708	0.948	1.760	4.880
2023	1.760	0.948	0.812	5.828
2024	0.812	0.948	-0.136	6.776
2025	-0.136	0.948	-1.084	7.724
2026	-1.084	0.948	-2.032	8.672
2027	-2.032	0.948	-2.980	9.620
2028	-2.980	0.948	-5.960	12.60
2029	-5.960	0.948	-6.908	13.548

Year	Permitted Reserves at Start of Year 3.77 additional reserves of 7.47 secured (mt) giving a total of 11.24 mt as end of 2013 and beginning of 2014	Draw Down During Year (mt) as per the 10 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 6.64mt
2030	-6.908	0.948	-7.856	14.496

Table 30 : Kent land-won Sharp Sand and Gravel Sales 2002-13

Year	Tonnes
2002	845,273
2003	1,119,039
2004	997,942
2005	1,171,000
2006	760,574
2007	1,078,357
2008	827,208
2009	736,432
2010	763,924
2011	619,855
2012	652,285
2013	583,432
Average sales 2011-13 (3 years)	0.62 mtpa
Average sales 2009-13 (5 years)	0.67 mtpa

Year	Tonnes
Average sales 2004-13 (10 years)	0.81 mtpa

Table 31 Landbank Calculations for Land-won Soft Sands with Preferred Site Options Included

Year	Permitted Reserves at Start of Year 14.720 additional 16.422 mt from Preferred Options Site Total 31.142 mt	Draw Down During Year (mt) as per the 10 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of mt (in any one year)
2013	31.142	0.756	30.386	0
2014	30.386	0.756	29.630	0
2015	29.630	0.756	28.874	0
2016	28.874	0.756	28.118	0
2017	28.118	0.756	27.362	0
2018	27.362	0.756	26.606	0
2019	26.606	0.756	25.850	0
2020	25.850	0.756	25.094	0
2021	25.094	0.756	24.338	0
2022	24.338	0.756	23.582	0
2023	23.582	0.756	22.826	0
2024	22.826	0.756	22.070	0
2025	22.070	0.756	21.314	0
2026	21.314	0.756	20.558	0
2027	20.558	0.756	19.802	0

Year	Permitted Reserves at Start of Year 14.720 additional 16.422 mt from Preferred Options Site Total 31.142 mt	Draw Down During Year (mt) as per the 10 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of mt (in any one year)
2028	19.802	0.756	19.046	0
2029	19.046	0.756	18.290	0
2030	18.290	0.756	17.534	0
2031	17.534	0.756	16.778	0
2032	16.778	0.756	16.022	0
2033	16.022	0.756	15.266	0
2034	15.266	0.756	14.510	0
2035	14.510	0.756	13.754	0
2036	13.754	0.756	12.998	0
2037	12.998	0.756	12.242	0
2038	12.242	0.756	11.486	0
2039	11.486	0.756	10.730	0
2040	10.730	0.756	9.974	0

Table 32 : Landbank Calculations for All Land-won Sand and Gravels for Current Permitted Reserves (2014) with a Potential Total of 7.46 mt of Additional Sharp

Sands and Gravel and 16.422 mt of Additional Soft Sand Reserves Secured (Preferred Option Consultation May 2012 Sites)

Year	Permitted Reserves at Start of Year (18.50 mt plus additional reserves of 7.47 secured mt and an additional 16.422 mt with a total potential reserve 42.40 mt)	Draw Down During Year (mt) as per the 3 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 8.12 mt (in any one year)
2013	42.40	1.16	41.43	0
2014	41.43	1.16	40.18	0
2015	10.18	1.16	39.02	0
2016	39.02	1.16	37.86	0
2017	37.86	1.16	36.70	0
2018	36.70	1.16	35.54	0
2019	35.54	1.16	34.38	0
2020	34.38	1.16	33.22	0
2021	33.22	1.16	32.06	0
2022	32.06	1.16	30.90	0
2023	30.90	1.16	29.74	0
2024	29.74	1.16	28.58	0
2025	28.58	1.16	27.42	0
2026	27.42	1.16	26.26	0
2027	26.26	1.16	25.10	0
2028	25.10	1.16	23.94	0
2029	23.94	1.16	22.78	0
2030	22.78	1.16	21.62	0

Year	Permitted Reserves at Start of Year (18.50 mt plus additional reserves of 7.47 secured mt and an additional 16.422 mt with a total potential reserve 42.40 mt)	Draw Down During Year (mt) as per the 3 Year Sales Average per year	Reserves Remaining at End of Year (mt)	Further Reserves Required (Cumulative) to Maintain a 7 Year Landbank of 8.12 mt (in any one year)
2031	21.62	1.16	20.46	0
2032	20.46	1.16	19.30	0
2033	19.30	1.16	18.14	0
2034	18.14	1.16	16.98	0
2035	16.98	1.16	15.82	0
2036	15.82	1.16	14.66	0
2037	14.66	1.16	13.50	0
2038	13.50	1.16	12.34	0
2039	12.34	1.16	11.18	0
2040	11.18	1.16	10.02	0