Joint West Sussex Minerals Local Plan

Background Paper 2: Minerals in West Sussex

June 2014

west sussex county council

Working in Partnership

South Downs National Park Authority

Purpose

This Joint Minerals Local Plan Background Paper is one in a series which supports the development of the Joint West Sussex and South Downs National Park Minerals Local Plan (the Joint Minerals Local Plan). Under the provisions of Section 28 of the Planning and Compulsory Purchase Act 2004 and the Duty to Co-operate, the Joint Minerals Local Plan, prepared jointly by West Sussex County Council (WSCC) and the South Downs National Park Authority (SDNPA), will help decide how and where minerals should be dealt in West Sussex in the future.

This paper presents the most up to date evidence to support the development of the minerals supply that will be delivered by the Plan.

Background Papers are being used to identify baseline data and inform discussions with the community and key stakeholders. The Papers are intended to 'set the scene' and present the evidence as it stands at this stage, to enable the Authorities to work effectively with stakeholders to:

- Check information to ensure the Authorities knowledge and understanding of waste and minerals is up-to-date and robust;
- Identify potential issues, problems or concerns relating to the production of minerals in West Sussex.

Information gathered in response to the Background Papers will assist the progress of the Joint Minerals Local Plan to the next stage. You are invited to comment on the Papers or provide further related information.

More information about the Plan can be found on the Council's website: www.westsussex.gov.uk/mwdf. If you require clarification on any of the content within this document please contact us at: mwdf@westsussex.gov.uk.

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1. Introduction

1.1. This Background Paper sets out the information which has been collected as part of the preparation of the Joint Minerals Local Plan.

1.2. The Joint Minerals Local Plan will consider the provision of minerals supply in order to ensure that a steady and adequate supply is planned for. This paper will cover what was previously known as the "apportionment" of sand and gravel, and also providing for other minerals including chalk, building clay, silica sand, and oil & gas.

1.3. National Policy, as set out in the National Planning Policy Framework (NPPF), requires Mineral Planning Authorities to plan for a steady and adequate supply of aggregates by producing a Local Aggregates Assessment (LAA) based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine dredged, secondary and recycled sources). The Government reaffirmed their view that *minerals are essential to support sustainable economic growth and our quality of life* (NPPF para. 142). This document will discuss the LAA prepared by the Authorities to ensure that a steady and adequate supply is achieved through the Plan period.

1.4. The LAA has a crucial role to play in monitoring the supply and demand of aggregates annually and indicates any reliance on land-won minerals, imports to wharves and railheads, and the use of recycled and secondary aggregates to meet the needs of West Sussex over the Plan period. Safeguarding of minerals infrastructure ensures that identified demand for mineral can be met, whilst annual updates to the LAA will provide an indication of whether or not the safeguarded capacity is sufficient to meet needs over the Plan period.

2. Types of minerals

2.1. There are many sources of minerals which have an important part to play in the prosperity of the nation and the quality of life of residents. These include crushed rock and sand and gravel which are known as aggregates. There are three main sources of aggregates in the UK;

- Land-won aggregates;
- Marine-dredged aggregates
- Recycled/secondary aggregates.

Other minerals which the Joint Minerals Local Plan will address include clay, chalk, the potential for silica sand, and oil and gas.

2.2. Land-won aggregates (also known as primary aggregates) includes crushed rock and sand and gravel extracted directly from the land at quarries or pits. 'Sand and gravel' is a general term which includes soft sand and sharp sand and gravel aggregate. This term is often used as soft sand and sharp sand and gravel sales figures cannot be separately identified due to commercial sensitivity of sales information. Land won aggregates are used for construction of houses, buildings, roads and other developments.

2.3. Marine-dredged aggregates comprise sand and gravel which is dredged from the sea floor and landed at dedicated mineral wharves (see Background Paper 4 for further information). Marine dredged sand and gravel meets 20% of sand and gravel demand in England and Wales and 16.8 million tonnes of sand and gravel was dredged in 2012 (supplying England and Wales)[1]. Marine-dredged sand and gravel is used in the same way as land-won sand and gravel; however a percentage of this is also used for coastal management such as beach replenishment.

2.4. Recycled and secondary aggregates come from various sources including the demolition of buildings and structures, or from civil engineering works. The production of recycled aggregates generally requires mobile or fixed plant equipment to process inert waste. High quality recycled aggregates can be deployed in other markets and can include, for example, incinerator bottom ash or shredded tyres.

Minerals in West Sussex

2.5. The Plan area lies largely within the 'Wealden District' described by the British Geological Survey. Beds of deposited material have been pushed into

[1] The Crown Estate (2014) Marine Aggregates, Capability & Portfolio 2013

a dome or 'anticline' that has then been eroded. In simple terms, this has led to a sequence of broad zones from the south to the north-east of the Plan area:

- brickearth, London Clay and gravels along the coastal plain;
- the chalks of the South Downs;
- various beds forming the Upper Greensand, Gault Clay and Lower Greensand to the north of the chalk downs;
- the clay area of the Low Weald; and
- mixed area of sandstones and clays forming part of the High Weald in a triangle between Horsham, East Grinstead and Burgess Hill.

2.6. These areas are shown on the maps in Appendix 1. More detailed information on the geology of West Sussex is contained in the British Geological Survey Documents which are available online at www.westsussex.gov.uk/mwdf.

2.7. Minerals can only be extracted where they occur due to the geology. There are a number of extraction sites in the Plan area which have planning permission, and are either active, dormant, or in a phase of restoration. There is also a local demand for crushed rock, however as there are no primary sources within the Plan area these are imported via aggregate wharves or railheads. For more information on the importation of minerals into West Sussex, please see the Wharves and Railheads Study, and also Background Paper 4. A map showing all permitted extraction sites within the Plan Area can be seen in Appendix 2 of this document.

2.8. There are three broad categories of sand which should be considered by the Authorities. These are set out below in Table 1:

Table 1: Types of Sand

Type	Description and uses
Soft Sand	Fine-grained sand in which the individual grains are well-rounded, imparting a relatively soft texture and free-flowing nature to the sand, bedrock, or 'solid' sand deposits comprising the cretaceous, Folkstone formation. This type of sand is used in mortars and plaster, and is collectively known as 'building sand'. There are currently no marine dredged supplies of soft sand which can provide a substitute source of supply to land-won supplies.
Sharp Sand	Sharp sand tends to be relatively coarse with more angular grains. These sands are generally used within

	concrete products.
Silica Sand	Sand which is predominantly made up of silica grains. The Folkstone Formation of the Southern Weald has been little worked as a source of silica sand. It is generally used for non-aggregate purposes in a range of high value industrial and manufacturing applications such as glass manufacture, foundry sand, sands for brick facings, and water filtration.

Aggregates

2.9. **Sand** is won from the Sandgate Formation and the Folkestone Formation which is worked in a number of locations in West Sussex. The variable grain size and low clay content mean that little or no processing is required to produce high quality building sands for mortar (soft sand). These sites largely lie within the South Downs National Park.

2.10. **Gravel** of varying quality and some sharp sand is found to the south of the Downs in the south-west of the County in superficial or 'drift; deposits. Coarser, silty gravels lie over the chalk to the north of a line approximating to the route of the A27 and have been exploited in dry workings. Overlying the clay to the south, cleaner, better-sorted gravels have been exploited through wet working as evidenced by lakes around the eastern and southern fringes of Chichester. Gravel sites are clustered around Chichester and south of the Downs from the Funtington area in the west to Slindon in the east. For more information on these sites see our Annual Monitoring Report.

2.11. Evidence collated through stakeholder engagement in 2008/09 provided some information on the quality of sand and gravel resources outside the SDNP. Borehole research by an operator on unconsolidated sand deposits indicated that deposits to the east of Steyning are finer and dirtier which may make extraction uneconomic on any significant scale. Operators also noted that:

- in the Storrington area a lot of the land is National Trust owned;
- Gravel deposits get much thinner to the south east and are therefore uneconomic to work; and
- The western end of the gravel deposit, south of the A27, would also be uneconomic.

2.12. **Recycled and Secondary aggregates** have an important role to play in West Sussex as they can reduce the demand for primary aggregates. There are a number of sites in the Plan area that recycle aggregate, which have

been safeguarded through the Waste Local Plan. For more information on these, please see the Annual Monitoring Report and LAA.

2.13. The policies within the Joint Minerals Local Plan, when developed, will enable the Authorities to make land use planning decisions for all of the above mentioned minerals, as well as on other relevant mineral infrastructure, such as wharves and railheads.

Other Minerals

2.14. **Clay** extraction in West Sussex, for the purposes of brickmaking, has a long established history in the central and north eastern parts of the county. Wealden stock bricks continue to be produced and have a distinctive character. Clay is also used for the production of tiles and pipes, and clay can also be used in the production of cement manufacture, and lining canals and lakes. There are seven active clay sites in West Sussex, some of which are small operators, which account for 20-25% of the total in the Country. For more information on these sites see the West Sussex Annual Monitoring Report.

2.15. **Sandstone** is won from the Hythe Formation with two active quarries near Midhurst and Petworth. Horsham Stone is worked from sandstone and limestone units within the Weald Clay. It is a traditional source of building stone and high quality paving and roofing stone. Ardingly Stone is quarried from the lower Tunbridge Wells sand. There are currently four active sandstone extraction sites in West Sussex. For more information on these sites see the West Sussex Annual Monitoring Report.

2.16. **Chalk** has been worked in the South Downs historically for agricultural use and construction fill, although very few pits remain in operation today. The existing chalk sites are along the line of the Downs, and just to the north is a belt of sand workings. There are currently six permitted chalk pits in West Sussex, of which only two are active, both within the SDNP. For more information on these sites see the West Sussex Annual Monitoring Report.

2.17. **Silica Sand** is found in very few parts of the UK, it is a rare industrial mineral resource of national importance used for a number of specialist uses. These include the manufacture of glass, foundry sand and specialist sports (e.g. golf courses and polo pitches). In the south east of England, it occurs in the upper reaches of the Lower Greensand formation. There are no current silica sand sites classified as such in the Plan area. The only evidence to suggest such resources may exist is set out within a recent Review of Old Mineral Permission (ROMP) application at a site near Minsted, where the site operator has indicated that the material for extraction is

'industrial sand'. Evidence is therefore required in order to ascertain if the classification of any of the existing soft sand sites, as well as any new sites that may come forward, may change from soft sand to silica sand. The distinction between silica & construction sands is based principally on their end-use applications and market specifications, rather than a fundamental difference in the two raw materials in the ground.

2.18. **Onshore Hydrocarbons**, in the form of oil and gas resources, are found across the Plan area. The Singleton oilfield has been in production since 1991 and the oilfields at Lidsey and Storrington are also in production at present. Petroleum Exploration and Development Licences (PEDLs) have been granted by the Government since the early 1980s, there are currently 14 Licences which cover most of the Plan area. There are currently three permitted exploration sites: Markwells Wood, Forestside (active - within the SDNP); Balcombe (inactive), and Broadford Bridge (inactive). There are currently two planning applications for exploration at Fernhurst (within the SDNP) and Kirdford/Wisborough Green.

3. Aggregate minerals

Local Aggregates Assessment

3.1. As stated in the NPPF, the Authorities are now required to plan for a steady and adequate supply of minerals through the production of an LAA which feeds into the national Managed Aggregate Supply System (MASS). The Authorities have published their LAA which is available online.

3.2. MASS seeks to ensure a steady and adequate supply through national, sub-national and local partners working together. At a local level (such as West Sussex) an LAA must be produced. At sub-national level, the South East England Aggregate Working Party (SEEAWP) takes account of data collated by members[2] of the AWP and produces a comprehensive, data set for the purposes of monitoring the supply of minerals in the south east. At a national level, the National Aggregate Co-ordinating Group monitors the overall provision of aggregates in England.

3.3. Government Guidance on the preparation of an LAA is set out in the *Planning Practice Guidance* (DCLG, 2014). It states the following should be covered;

- A forecast of the demand for aggregates based on the average 10 year sales data and other relevant local information;

[2] SEEAWP membership includes the mineral planning authorities and industry representatives.

- An analysis of all aggregate supply options, as indicated by landbanks, mineral plan allocations and capacity data e.g. marine licences for marine aggregate extraction and the potential throughput from wharves;

- An assessment of the balance between demand and supply, and the economic and environmental opportunities and constraints that might influence the situation. It should conclude if there is a shortage or surplus of supply and, if the former, how this is being addressed.

Sand and gravel

3.4. The West Sussex LAA sets out that the 10 year average sales (from 2003 – 2012) for sand and gravel is 503,700tpa.

3.5. The LAA identifies the current supply (based on sites with planning permission), as 4,801,400 tonnes from a total of nine sites. This includes both sharp sand and gravel, and soft sand sites (see Table 2 below). The Authorities cannot disclose the reserve split between sharp sand and gravel and soft sand due to commercial confidentially. NPPF requires mineral planning authorities to maintain a landbank of at least seven years. The landbank at present, based on the 10-year average sales, is 9.5 years.

Table 2: Permitted sand and gravel extraction sites

Soft Sand			
Location	**Site**	**Operator**	**Status**[3]
SDNP	Heath End Quarry, Duncton, Petworth	Dudman Group Ltd.	Active winning and working of sand.
SDNP	Minsted Sandpit, Minsted Common, Midhurst	Dudman Group Ltd.	Active winning and working of sand.
SDNP	West Heath Quarry, West Harting, Petersfield	CEMEX UK Operations	Active winning and working of sand.
West	Rock	Dudman	Active Sand extraction.

[3] Information regarding the remaining permitted reserve at each site is commercially sensitive and can only be presented in an amalgamated figure.

Sussex	Common Sandpit, Washington, Pulborough	Group Ltd.	Concrete batching plant. Aggregates recycling.
West Sussex	Sandgate Park Quarry, Water Lane, Sullington, Storrington	CEMEX UK Operations	Active winning and working of sand.
West Sussex	Washington Sand Pit, Hampers Lane, Sullington	Britannia Crest Recycling Ltd.	Inactive. Application being considered.
West Sussex	Chantry Sand Pit, Chantry Lane, Storrington	Dudman Group Ltd.	Inactive with permitted reserves
Sharp Sand and Gravel			
West Sussex	Hambrook Gravel Pit	No operator in place at present.	Gravel extraction. Permitted but not active
West Sussex	Land at Kingsham, South of Chichester, Chichester, West Sussex, PO19 8XH	Dudman Group Ltd.	Gravel extraction. Application permitted but not yet implemented.

3.6. The Authorities have also considered the potential reserves from the five sites allocated in the existing Minerals Local Plan (2003). There is a total potential reserve of 7,010,700 tonnes from the currently allocated sites (see Appendix), however the Dunford Rough and Lavant sites are no longer deemed to be viable for extraction, and the remaining allocations (three in total) are likely to give a much lower reserve total of 1,689,900 tonnes. Further information on the allocations and their viability is set out in the LAA.

Table 3: Allocations in the Minerals Local Plan (2003)

Location	Allocation (resource)	Potential yield (tonnes) set out in 2003 MLP	Updated yield in 2013 (tonnes)
SDNP	Dunford Rough	2,920,800	0*

	(sand)		
West Sussex	Woodmancote (gravel)	449,700	449,700
West Sussex	Westhampnett (gravel)	388,800	388,800
West Sussex	Slades Field (gravel)	851,400	851,000
West Sussex	Lavant (gravel)	2,400,000	0**
Total		**7,010,700**	**1,689,900**
* This site is deemed undeliverable due to restrictive covenants and access difficulties. ** Following the refusal of planning permission for mineral extraction in 2009, the landowner has sold the land, but retained the mineral rights. A planning application for a non-minerals use has been submitted.			

3.7. The site identification and assessment methodology is set out in Background Paper 3, and will form the basis for finding suitable sites to meet the need to ensure a steady and adequate supply during the Plan period. The current allocations will not automatically be carried forward and will be fully assessed alongside other potential sites.

3.8. As set out in the LAA, the Authorities have calculated the requirements for sand and gravel provision through the Plan period. The total need through the Plan period is **9,066,600 tonnes.** This is calculated by multiplying the 10-year average sales data by the number of years the Plan will cover (18 years). The permitted reserves within the Plan area are currently 4,801,500 tonnes. The shortfall, and therefore the amount of sand and gravel that must be delivered through the Plan, is **4,265,200 tonnes**[4]. For more information on how this shortfall has been derived please refer to the LAA. This shortfall will be met through the allocation of sites, preferred areas, or areas of search.

Question 2.1
Is the data used to calculate the shortfall (presented above and within the LAA) of aggregates accurate? Is there any other data/evidence that should be used?

Soft sand and sharp and gravel: Reserve Split

3.9. National Planning Practice Guidance identifies that Mineral Planning Authorities should consider identifying a split in the reserve between sharp sand and soft sand where possible. This is to ensure that the MLP makes

[4] This figure excludes the allocations in the Minerals Local Plan 2003, as set out in table 3, as the sites will be re-evaluated

provision for the correct quality of aggregate, as appropriate for its intended use, since not all aggregates can be used for all construction purposes.

3.10. Given the constraints of commercial confidentiality resulting from the low number of sites in the Plan area which are producing soft sand, it has not been possible to identify a split in the reserve as set out within the LAA. However, it may be possible to estimate the split based on a reasonable assessment of the demand for such material as indicated through the past 10 years sales. Evidence suggests that the historical split is between 70-80% soft sand and 20-30% sharp sand & gravel. Discussions will take place between the Authorities and the minerals industry to seek their views on this approach. On the basis of differencing splits, the requirements would be as follows:

- 80% soft sand and 20% sharp sand and gravel:
    - Soft Sand: **3,412,160 tonnes (80%)**
    - Sharp Sand and Gravel: **853,040 tonnes (20%)**
- 70% soft sand and 30% sharp sand and gravel:
    - Soft Sand: **2,985,640 tonnes (70%)**
    - Sharp Sand and Gravel: **1,279,560 tonnes (30%)**

Question 2.2
Are there any other issues or evidence which should be considered for the purposes of planning for a steady and adequate supply of soft sand and sharp sand and gravel through the Plan period?

Supply and demand

3.11. It is deemed appropriate to consider other relevant information, beyond the 10 year rolling average, which may impact on the supply or demand of aggregates within the Plan area. There are a number of considerations which may form other local relevant information, such as:

- Geological resources being exhausted within the Plan period;
- Changes in the availability of other supply routes such as marine aggregate wharf capacity;
- The emergence of new sources of recycled or secondary material becoming available;

- Major infrastructure projects being developed within the plan area, or other indications of significant or increased demand; or

- Significant conservation areas being designated in the aggregate producing areas.

Imports and exports

3.12. The Authorities recently commissioned a Wharves and Railheads Study (available online at www.westsussex.gov.uk/mwdf) which provides a more detailed analysis of activities at these sites, and also provides scenarios for safeguarding wharves and railheads which the Authorities will consider as part of the plan-making process.

3.13. Information and data on imports/exports is collated every four years when Department of Communities and Local Government and the British Geological Survey conduct a national survey. The last national survey took place in 2009 (AM2009). The 2013 survey is currently in progress but has not been finalised.

3.14. The AM2009 data shows that 78% of the total sand and gravel consumed in West Sussex (land won and marine sand and gravel) was supplied from within West Sussex. In total, 54,141 tonnes of sand and gravel was imported in 2009, whilst a total of 626,105 tonnes was exported. A large amount of this material was exported to East Sussex and Brighton and Hove. There are limited reserves of sand and gravel in East Sussex, and there are no active wharves in East Sussex or Brighton and Hove, with marine won sand and gravel largely being supplied from wharves at Shoreham Port in West Sussex.

3.15. West Sussex relies heavily on the import of crushed rock by rail or sea, there being no such resource available in the County. Imports predominantly come from Somerset via rail to the five railheads in West Sussex. In total, 367,000 tonnes were imported to West Sussex in 2008. Some of this material is exported from West Sussex to neighbouring authorities by HGV.

3.16. Mineral Planning Authorities are required to carry out annual survey of aggregates data which includes wharves and railheads. This provides the Authorities with information on annual imports (excluding the origin of the materials with regards to crushed rock imports). The data, as set out in Tables 10 and 11 of the LAA and also the Wharves and Railheads Study and shows that:

- The 10 year average (2003-2012) of marine dredged sand and gravel **landings** is 854,136tpa;

- The 10 year average (2003-2012) of marine dredged sand and gravel **sales** is 854,754tpa;

- The 10 year average (2003-2012) of crushed rock **landings** from wharves is 117,155tpa;

- The 10 year average (2003-2012) of crushed rock **sales** from railheads is 403,072tpa;

- The 10 year average (2003-2012) of sand and gravel **sales** from railheads is 112,234tpa.

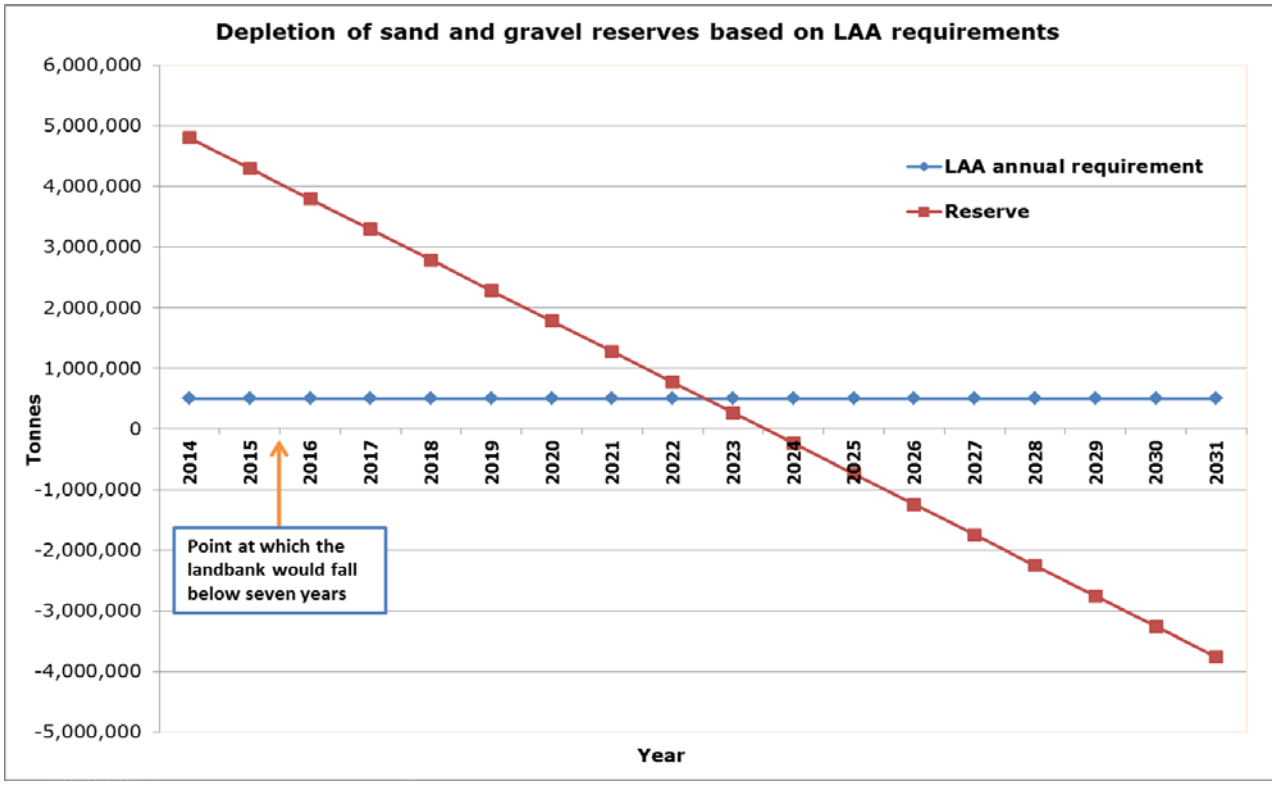
3.17. The Authorities will seek to ensure that the flows of minerals to and from West Sussex continue through the safeguarding of minerals infrastructure and through discussions with other relevant Minerals Planning Authorities as part of the duty-to-co-operate. For further information please refer to Background Paper 4.

3.18. The Authorities have considered key developments and infrastructure projects which may come to fruition and require the supply of aggregates, as set out in paragraph 3.4 of the LAA. The Authorities consider that these projects, if they come forward, are unlikely to increase demand beyond that seen during the previous ten years. There is presently no clear significant evidence to suggest that an upturn in demand will occur.

Question 2.3
The Authorities feel that the economic activity in the coming 10-15 years will not result in a significantly increased demand for aggregates supplied in West Sussex. Do you agree? If no, please provide evidence (with particular reference to specific schemes if possible).

3.19. The supply of aggregates, as discussed above, comes from a variety of sources. National Planning Practice Guidance (2014) states that the LAA should include an assessment of the balance between supply and demand, seeking to conclude whether there is a shortage or surplus in demand.

3.20. The LAA has concluded that for sand and gravel, there is a shortage of permitted reserves, and the Authorities will address this shortage through the allocation of new areas to meet demand. The point at which any new sites will be required to come online is difficult to estimate, however based on the 10 year average data as an annual amount extracted, it is expected that the reserve would be depleted by 2023. The Authorities are required, by NPPF, to maintain a seven year landbank. Without any new permissions being granted, the landbank will fall below seven years at the end of 2015. The chart below shows the expected depletion of reserves and the crucial dates at which the landbank would fall below seven years supply, and also the point at which reserves are expected to run out (2022/23), should no sites be granted permission.



Supply of aggregates from the South Downs National Park

3.21. The South Downs National Park came into being in 2010, in recognition of the importance of the landscape and scenic beauty. The South Downs National Park Authority (SDNPA) has statutory purposes and a socio-economic duty as specified in the Environment Act of 1995. These purposes are:

- To conserve and enhance the natural beauty, wildlife and cultural heritage of the area.

- To promote opportunities for the understanding and enjoyment of the special qualities of the Park by the public.

3.22. In pursuit of these purposes the SDNPA has a duty to seek to foster the social and economic wellbeing of the local community. West Sussex County Council also has a duty to have regard to the purposes of the SDNP.

3.23. Given the significance of the designation and the importance of conserving and enhancing, the special qualities of the SDNP, the potential adverse impacts which can arise from aggregate extraction within the Park area is of particular concern. National parks and AONB's are given a greater degree of protection from minerals working. The need for mineral workings in such areas has to be justified by the most rigorous examination of the merits of the proposal, and demonstration of 'exceptional circumstances' (set out below).

3.24. By virtue of its scale, character and nature, minerals development has the potential to have a serious adverse impact upon the natural beauty, wildlife, cultural heritage and recreational opportunities provided by the South Downs National Park. Minerals development is therefore considered as 'major development', requiring the demonstration of 'exceptional circumstances' (Paragraph 116 of the NPPF). Major development for the purposes of policy is defined as development that, by reason of its scale, character or nature, has the potential to have a serious adverse impact on the natural beauty, wildlife, cultural heritage and recreational opportunities provided by the South Downs National Park.

3.25. Views and evidence from mineral operators in the Plan area has previously indicated that the majority of the viable soft sand resource that is considered possible to extract is located within the SDNP.

Key Challenge / Issues
The Minerals Plan must provide a framework to ensure a steady and adequate supply of minerals to meet requirements to support the local economy and contribute to wider economic growth in the UK. The Authorities must gather evidence to enable the consideration of a range of sites which may be required across the whole Plan area. The challenge for the Minerals Plan, resulting from the location of the majority of the viable soft sand resource in and adjacent to the SDNP, will be to provide for a steady and adequate supply of minerals whilst ensuring that the special qualities of the SDNP are conserved and enhanced.

4. Non-aggregate minerals

Clay

4.1. Clay is used for brickmaking in West Sussex, which has been long established in the central and north eastern parts of the Plan area and there are currently are seven active clay extraction sites in West Sussex. Clay is not subject to an apportionment figure but still has an important role to play in West Sussex and the wider economy. Overall there is a permitted clay reserve of 14.5 million tonnes, which equates to 50 years of extraction at current rates. These produced a total of 288,660 tonnes in 2012/13.

4.2. The NPPF states that a 25 year landbank should be maintained for individual sites. At present, the landbank for clay is 50 years, and for individual sites, the landbanks for three of these sites is beyond 25 years.

Question 2.4
Are there any additional issues or evidence required for clay that have not been identified?

4.3. In line with NPPF, only investment in brickworks such as the development of a new kiln at new or existing brickworks and/or the maintenance and improvement of existing plant and equipment, would trigger the need to identify additional clay resources to supplement the current landbank. Any investment proposed in line with the above, may require the inclusion of a policy within the Plan to ensure that such investment is supported by a supply of clay equivalent to at least 25 years.

4.4. At present, no such investment has been communicated to the Authorities. The Authorities will undertake engagement with the seven brickwork operators to ensure that, should they require further mineral resource in future, that appropriate safeguarding or allocations are considered.

Sandstone

4.5. There are four active building stone extraction sites in West Sussex and one inactive site. There is only one active crushed rock extraction site in West Sussex. Thus, in order to maintain commercial confidentiality, the production and landbank figures for crushed rock and building stone cannot be reported separately, but are reported in a combined figure. There is currently a reserve of 2.43 million tonnes of permitted sandstone, and annual production (over the last ten years) ranges between 1000 tonnes (2011/12) and 40,000 tonnes (2006/07).

4.6. There is no requirement for Authorities to make provision for the production of sandstone as it is generally a small-scale industry which provides local stone of distinctive character. NPPF does however state that local planning authorities should safeguard mineral resource of local and national importance (para. 143, NPPF) and '*consider how to meet demand for small-scale extraction of building stone….for the repair of heritage assets'* (para. 144, NPPF).

4.7. English Heritage and the British Geological Survey (BGS) are currently working with planning authorities to develop a national database of strategic stone resources. The SDNPA is seeking to work with English Heritage and BGS to complete a Strategic Stone Study which will also cover parts of West Sussex outside the SDNP. The outputs from this study will include the production of data (including GIS information) linking the sources of specific stone (historic quarries etc) with specific historic buildings requiring the use of such stone for restoration/conservation.

4.8. The Plan will need to ensure that important stone quarries are safeguarded. It will also be important to monitor sandstone use due to its importance for conservation and restorative purposes. A criteria based policy approach may be necessary to ensure permissions can be sought for new sandstone quarries. Any policy approach for sandstone to be included within the Plan will be based upon the evidence supplied through the Strategic Stone Study and will be supplemented with evidence from other stakeholders, including the wider public, as relevant.

Question 2.5
Are there any additional issues or evidence required for sandstone that have not been identified?

<u>Chalk</u>

4.9. There are six chalkpits in the Plan area, of which two are currently active. Figures for these cannot be disclosed due to commercial confidentiality. The estimated chalk reserves at 12.41 million tonnes in West Sussex.

4.10. Apart from acting as an essential aquifer, chalk in the Plan area is extracted for agricultural lime production and, on rare occasions it is extracted for construction fill. Chalk is also used for cement manufacture, but there are no active cement works in the Plan area, as this practice has ceased. Furthermore, chalk can be used as a restorative and conservation material (for example in the crypt of Chichester Cathedral). The chalk resource acts

as an important aquifer in the South East and provides the principal source of water supply in West Sussex.

4.11. The NPPF states that stock of at least 15 years for cement manufacture should be maintained (para.146, NPPF). In line with NPPF, only investment in new cement works would trigger the need to identify additional chalk resources to supplement the current landbank. Any investment proposed may require the inclusion of a policy within the Plan to ensure that such investment is supported by a supply of chalk equivalent to at least 15 years.

4.12. At present, no such investment has been communicated to the Authorities. The Authorities will undertake engagement with the chalk operators to gain an understanding of future needs in West Sussex.

Question 2.6
Are there any additional issues or evidence required for chalk that have not been identified?

Recycled and secondary aggregates

4.13. There are 11 sites within the Plan area that produce recycled aggregates (see Tables 5 and 6 of the LAA), eight of which are dedicated aggregate recycling sites, and three of which additionally carry out other waste processing activities. The total capacity provided by these sites is 685,878 tonnes per annum (tpa). It is however likely to be higher than this amount due to the use of on-site mobile recycling facilities (for example when buildings are demolishes as part of a new development).

4.14. Sales of recycled and secondary aggregates in West Sussex have increased by 56% between 2003 and 2012, peaking at 630,000 tonnes in 2010. This increase corresponds with a fall in primary aggregate sales which began to decline in 2003.

4.15. Recycled and secondary aggregates are important, in order to drive inert waste up the waste hierarchy, whilst also reducing the need for primary aggregates. The Authorities are keen to promote the use of recycled and secondary aggregates. The existing policy in the adopted Waste Local Plan (April 2014) supports the use of inert materials in this way. At present, there is an estimated surplus in processing capacity at sites compared to the amounts of material being produced.

4.16. The adopted Waste Local Plan (April 2014) has safeguarded important aggregate recycling sites. As recycled and secondary aggregate producing

sites are dealing with inert wastes, any planning applications for these sites continue to be determined in accordance with the Waste Local Plan, and there will be no requirement in the Joint Minerals Local Plan to allocate sites for this activity.

Question 2.7
Are there any additional issues or evidence required for recycled and secondary aggregates that have not been identified?

Industrial minerals - silica sand

4.17. The NPPF identifies silica sand as a mineral of local and national importance and sets out the requirement to plan for a steady and adequate supply of industrial minerals. This includes the provision of a stock of permitted silica sand reserves to support the level of actual and proposed investment required for new or existing plant and the maintenance and improvement of existing plant and equipment of at least 10 years for individual silica sand sites and at least 15 years for silica sand sites where significant new capital is required as far as possible and realistic.

4.18. Silica sand provision is therefore tied to the operational life of individual site reserves and sufficient landbanks need to be identified on a site by site basis. Further evidence will be gathered from operators of existing soft sand sites to determine whether they should be classified as part soft sand and part silica sand sites, or wholly silica or wholly soft sand. If any sites that currently form part of the permitted reserve for soft sand are subsequently reclassified as silica sand, then the aggregate shortfall will need to be recalculated.

4.19. The 'call for sites' may also result in the promotion of silica sand sites, which will have to be considered in the context of the national policy for silica sand and, for any sites within the South Downs National Park, consideration of whether exceptional circumstances exist; taking into account the great weight that should be given to conserving landscape and scenic beauty and consideration of whether the need can be met from outside the SDNP.

Question 2.8
Are there any additional issues or evidence for silica sand that have not been identified?

Onshore hydrocarbons

National Policy

4.20. National policy, set out in the White Paper on energy[5] highlights the UK's current dependence on energy supplies from outside of the UK and the need to reduce that reliance. Government policy for Energy Infrastructure is set out in a series of National Policy Statements published in 2011. National energy policy is that oil and gas make an essential contribution to the country's prosperity and quality of life. They play an important part of the UK's energy mix during the transition to low carbon energy supplies.

4.21. NPPF states that mineral extraction should not have unacceptable adverse impact on the natural or historic environment or human health (for example, the impact of increased activity on well-being). National guidance states that unconventional hydrocarbons are emerging as a form of energy supply. It supports that there is pressing need to establish (through exploratory drilling) whether unconventional hydrocarbons are present and economically viable for production.

4.22. The National Planning Policy Framework (NPPF) requires that mineral planning authorities make provision for the extraction of mineral resources of local and national importance. This includes provision for conventional and unconventional hydrocarbons[6].

4.23. Unlike aggregate minerals, such as sand and gravel, national policy does not require that mineral planning authorities identify specific sites to deliver a specific level of hydrocarbon development. The NPPF does not exclude designated landscapes from consideration for hydrocarbons. However, the National Planning Practice Guidance sets out that Local Plans should include:

- Petroleum Licence Areas and existing hydrocarbon extraction sites on policies map;
- Criteria-based policies for each of the exploration, appraisal and production phases of hydrocarbon extraction. These policies should set clear guidance and criteria for the location and assessment of hydrocarbon extraction within the Petroleum Licence Areas.

4.24. Minerals Planning Authorities may also identify the specific location of proposed future development, should the onshore oil and gas industry wish to promote specific sites.

[5] Energy white paper: meeting the energy challenge, 2007
[6] National Planning Policy Framework: Annex 2

Types of onshore hydrocarbon

4.25. There are two different types of onshore hydrocarbon, conventional and unconventional.

4.26. The term 'conventional hydrocarbons' refers to oil and gas that flows naturally through porous rocks (e.g. limestone, sandstone) into reservoirs under impermeable layers/'cap rock'. Vertical (and possibly horizontal) drilling is used for extraction. Extraction of these deposits in West Sussex has been taking place since the 1990s.

4.27. The term 'unconventional hydrocarbons' refers to oil and gas which is still trapped in impermeable rock (e.g. shale). Different technology (e.g. hydraulic fracturing) is required to extract the hydrocarbons. Vertical (and possibly horizontal) drilling is used for extraction. Extraction of these deposits has yet to occur in West Sussex.

Stages of hydrocarbon extraction

4.28. There are three distinct phases of extraction: exploration, appraisal, and production:

- Exploration Phase: Seismic surveys are used to understand the geological structure. Exploratory drilling (possibly including some hydraulic fracturing) is used to determine whether hydrocarbons are present. It is a short-term but intensive activity.
- Testing and Appraisal Phase: This phase may involve additional seismic work, flow-testing, or further drilling to establish whether the deposit can be economically exploited. It is usually a short-term activity.
- Production Phase: This involves the long-term production of oil or gas commercially.

4.29. Planning permission, as well as other [non-planning] consents/permits required under other regulatory regimes, is required for each stage. However, a planning application may include both the exploration and appraisal stage.

Hydraulic fracturing (fracking)

4.30. 'Hydraulic fracturing' is a process sometimes used to break open rock after a well has been drilled. The potential use of fracking depends upon the underlying geology and it should not be assumed that exploratory drilling will automatically involve fracking; it may not be needed if the rock is naturally

fractured to allow the resource to flow. The term 'hydraulic fracturing' covers a number of different processes and that the technology used depends upon the geology and the potential resource or resources that may be found.

4.31. High-pressure, high volume fracking uses liquid to open up and/or extend existing narrow fractures or to create new ones. Perforations are created in the rock and fluid (a mix of water, sand, and chemicals) is pumped under high pressure down the borehole through perforations into the rock. Sand props open the fractures allowing gas to flow out more readily. The chemicals (around 2%) are used for various purposes including providing lubrication and to kill bacteria.

Extraction in West Sussex

4.32. DECC have granted 14 PEDL Licences across West Sussex. The map in Appendix 1 indicates the extent of these Licences and also the sites listed in the following paragraphs.

4.33. Exploration for oil and gas in West Sussex took place during the 1980s and, at some sites, led to the award of appraisal licences. Borehole drilling then took place at 14 sites, including within areas now considered environmentally sensitive. However, only sites at Singleton (within the SDNP), Storrington, and Lidsey proved to be potentially productive at that time and they are still the only active production sites in the County.

4.34. Within the PEDL areas, there are currently three permitted exploration sites in West Sussex: Markwells Wood, Forestside (active – within the SDNP); Balcombe (inactive), and Broadford Bridge (inactive).

4.35. There are currently two planning applications for exploration at Fernhurst (within the SDNP) and Kirdford/Wisborough Green.

4.36. The British Geological Survey (BGS) were commissioned by the Department of Energy and Climate Change (DECC) to study the Jurassic shales of the Weald Basin in order to estimate the shale oil and gas resources in the Weald Basin, which includes West Sussex. The Study was published in June and the results show that there is unlikely to be any shale gas potential, but there could be shale oil resources in the range of 2.2-8.5 billion barrels of oil in the ground.

4.37. The report recognises that most of the identified shale oil potential falls on extant licences, so shale oil drilling and testing does not rely on the award of new licences. The licences within West Sussex which fall within the areas

considered prospective for oil in the Jurassic shales are PEDL 231 (also in the SDNP), PEDLs 235, 234, 243 and 244. The report also recognises that some of the most prospective plays are in environmentally sensitive areas – including the SDNP and High Weald AONB, as well as beneath towns and villages. Therefore the report concludes that *'shale oil exploration and potential development should progress cautiously to ensure that the activity is safe and the environment is properly protected'*.[7]

4.38. Whilst the report provides an estimate of the potential oil in the rock, this is different from the amount which can be recovered. The drilling and testing of new wells in the area will provide further understanding of the commercial viability of the resource and whether it is possible to achieve sustained production rates.

Future Licence areas

4.39. The Government has invited companies to apply for further onshore oil and gas licences through at 14th round of licensing. The necessary Strategic Environmental Assessment (SEA) report for the 14th licencing round was issued by the DECC in December 2013 for consultation. The report identifies, describes and evaluates the likely significant effects on the environment of DECC's proposals to invite applications for new licences, the reasonable alternatives to that plan, and how these effects can be reduced or offset. Views were sought on this until 28 March 2014.

4.40. The SDNPA responded to DECC in relation to the consultation on the SEA of potential new PEDL areas and raised concerns about the lack of recognition of the status of the Park within the assessment process.

4.41. Now that the consultation on the SEA has been completed, Ministers will consider the representations received before deciding whether to progress a further round of licences in 2014. DECC will take all responses into account and will then issue a "Post-Adoption Statement" which will summarise how the Government intends to proceed in relation to further onshore licensing.

4.42. If the decision is made to undertake a 14th round of licencing, operators will have the opportunity to apply for further onshore oil and gas licences. At this stage, the DECC will consider the nominations for licences before new licences are issued.

[7] The Jurassic Shales of the Weald Basin: Geology and Shale Oil and Shale Gas Resource Estimation (DECC 2014)

Key challenges/issues
The outcome of the DECC consultation on the SEA will dictate the extent of the PEDLs granted within the plan area. As recommended in the planning practice guidance, the extent of the PEDL areas granted across West Sussex, including in the SDNP, will be shown on the policies map of the Minerals Local Plan.

Regulation of onshore hydrocarbons

4.43. In relation to onshore hydrocarbon development, Mineral Planning Authorities have two main responsibilities:

- To prepare a Local Plan which guides the use and development of land for onshore hydrocarbon extraction and includes policies against which planning applications for such development will be judged;
- To determine planning applications for onshore hydrocarbon extraction.

4.44. Planning applications for onshore hydrocarbon development must be determined in accordance with the statutory 'development plan' (i.e. adopted local plans) unless 'material considerations' indicate otherwise; the latter include draft plans, Government guidance, and the views of consultees, landowners, and the public.

4.45. The Government has stated that a mineral planning authority should not consider the national demand for onshore hydrocarbon resources but only whether the use of land, and the impacts of the proposed development (including on health, the natural environment, and amenity), are acceptable or can be made acceptable (e.g. by attaching conditions to a permission to minimise or mitigate potential adverse impacts).

4.46. The initial step in any hydrocarbon exploration (to see whether oil/gas reserves are available) requires operators to obtain a Petroleum Exploration and Development Licence (PEDL) from the Department of Energy and Climate Change (DECC). This enables them to 'search and bore for and get' the Crown's resources (i.e. oil and gas).

4.47. In 2008, the 13th Onshore Licensing Round was completed and resulted in oil and gas licences being issued in West Sussex.

4.48. Each round of Licencing is an addition to the previous round. The initial term of a PEDL is set at 6 years and carries a work programme of exploration

activity that DECC and the licensee will have agreed as part of the application process. The licence will expire at the end of the initial term unless the licensee has completed the work programme.

4.49. The second term of 5 years is intended for appraisal and development. The PEDL will expire at the end of the second term unless the Secretary of State has approved a development plan. The third term of 20 years is intended for production.

4.50. Operators must apply to the minerals planning authority for planning permission for exploration and appraisal. In addition to gaining planning permission, the operator must also secure a 'well consent' for exploration from DECC before commencing works. DECC consults with the Environment Agency and the Health and Safety Executive at this stage.

4.51. The Environment Agency may also require environmental permits at the exploration phase.

4.52. If the company then wishes to enter into production (i.e. actually extracting oil/gas) they must gain new planning permission from the MPA, a Field Development Consent from DECC, and Environmental Permits from the Environmental Agency, with processes similar to those above.

Other regulatory regimes

4.53. Although not specifically related to the preparation of the Joint Minerals Local Plan, there are a number of matters that lie outside the planning system and which are not the responsibility of the County Council or the SDNPA as the minerals planning authorities (MPA). They include:

- seismic risks (Department for Energy and Climate Change - DECC);
- well design, construction, and integrity (Health and Safety Executive);
- mining waste (Environment Agency - EA);
- the chemical content of fracking fluid (EA);
- flaring or venting of gas (DECC/EA but the MPA considers the noise and visual impacts);
- the impact on water resources (EA); and
- the disposal of water following fracking (EA).

4.54. Mineral planning authorities are required to assume that non-planning regimes will operate effectively and that other statutory bodies will carry out their duties within the scope of their remits.

Question 2.9.1
What are the key issues which should be taken into account when considering the potential impact of onshore hydrocarbon development?

Question 2.9.2
Are different policy approaches required for different landscape areas (e.g. landscape character areas and/or designated landscapes) or the different type of oil and gas development in West Sussex? If yes, please indicate the approach to be considered and the evidence to support such an approach.

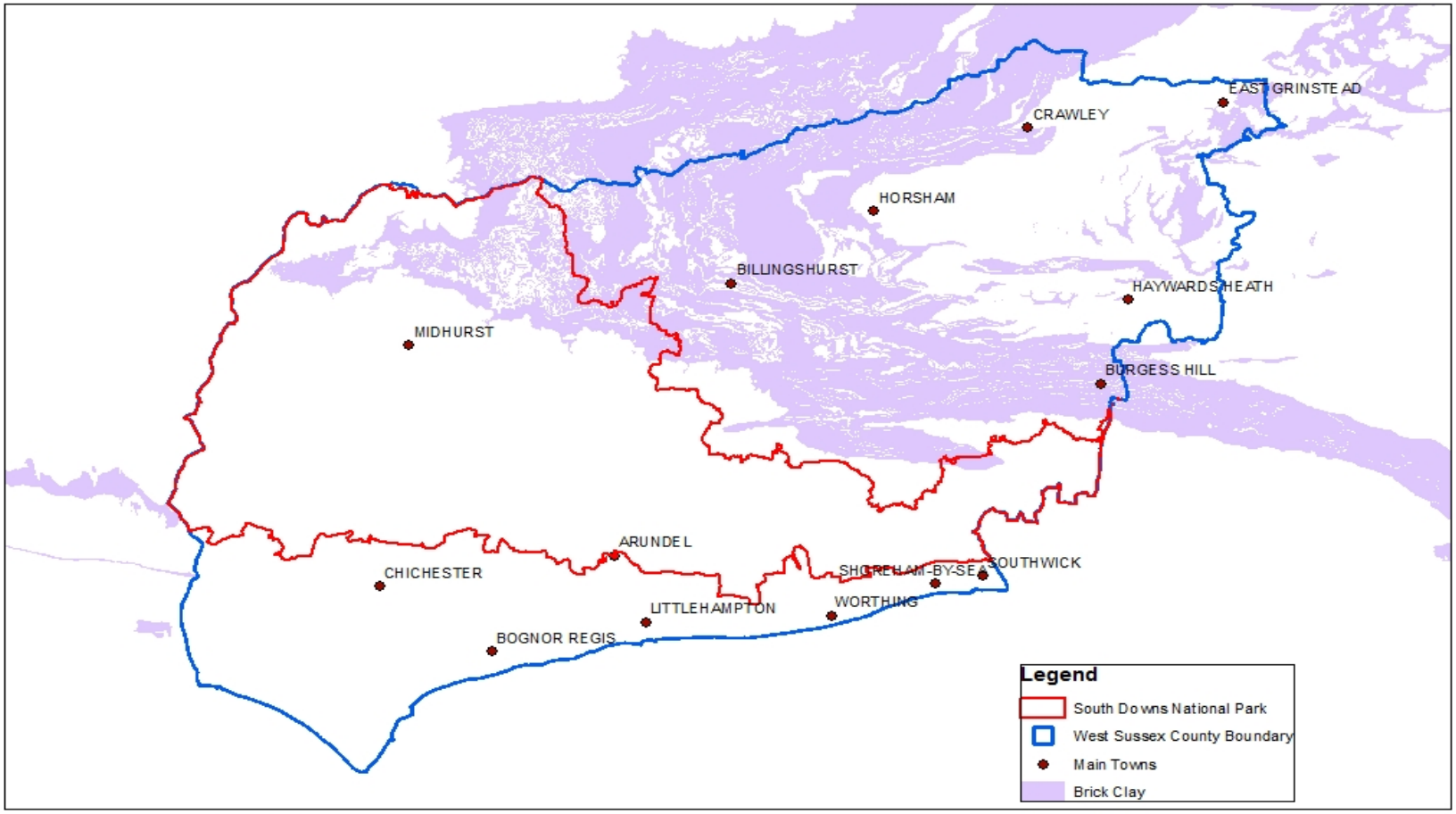
Supply and demand

4.55. Beyond aggregate minerals, the current evidence as set out in this Paper does not support the need to allocate new sites for other mineral activities within the Joint Minerals Local Plan.

4.56. However, there is a need to ensure that policies in the Plan protect existing minerals infrastructure and resources, and allow new infrastructure or resources to come forward.

Question 2.10
Is there a need to allocate mineral sites, other than sand and gravel sites, in the Plan? If yes, please set out the additional allocations which should be considered and a provide reasons to justify such an approach.

APPENDIX 1a: Mineral Resources in the Plan area- BRICK CLAY

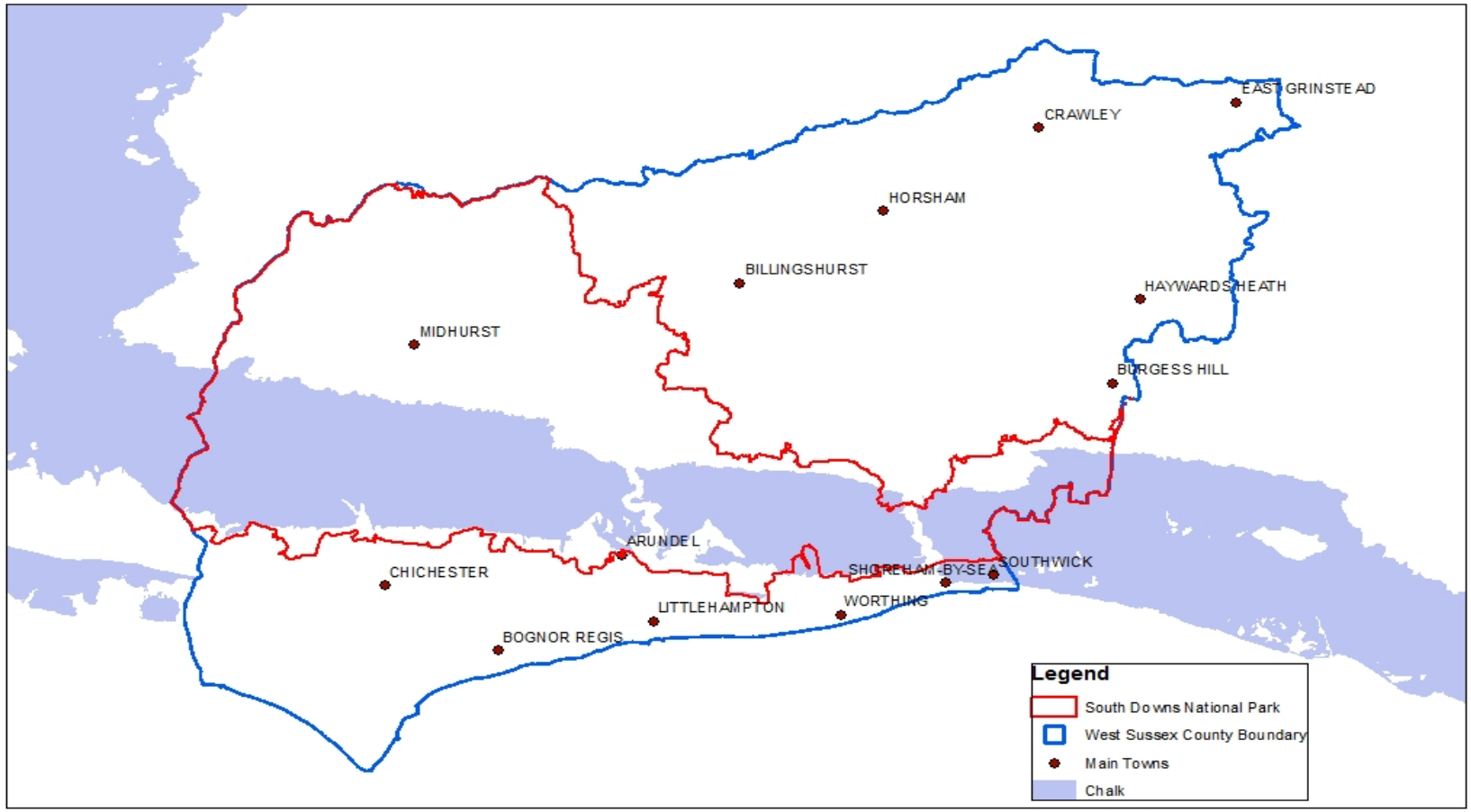


Brick Clay Resources in West Sussex

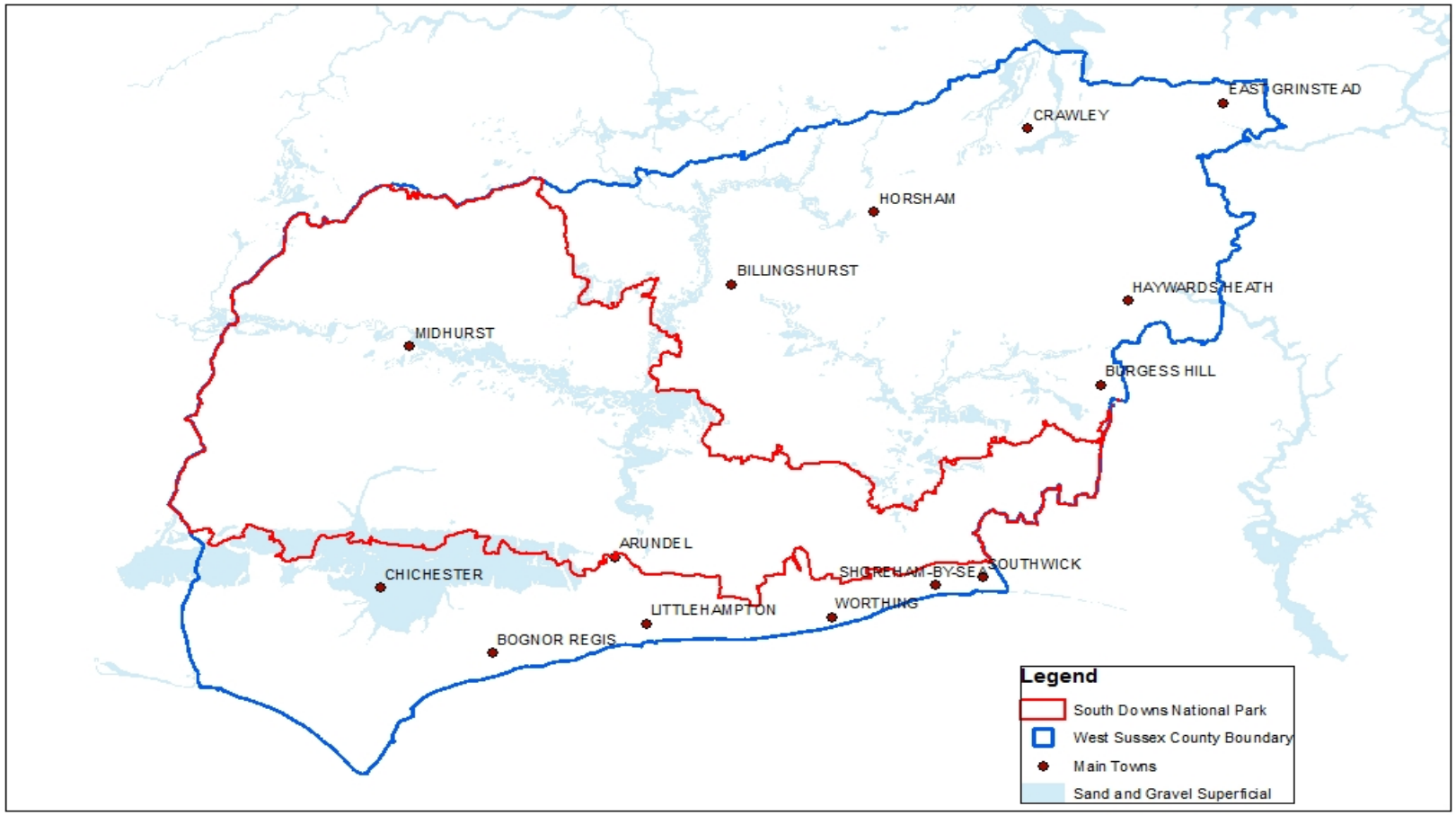
1:339,010

N

APPENDIX 1b: Mineral Resources in the Plan area- CHALK



APPENDIX 1c: Mineral Resources in the Plan area- SAND AND GRAVEL SUPERFICIAL

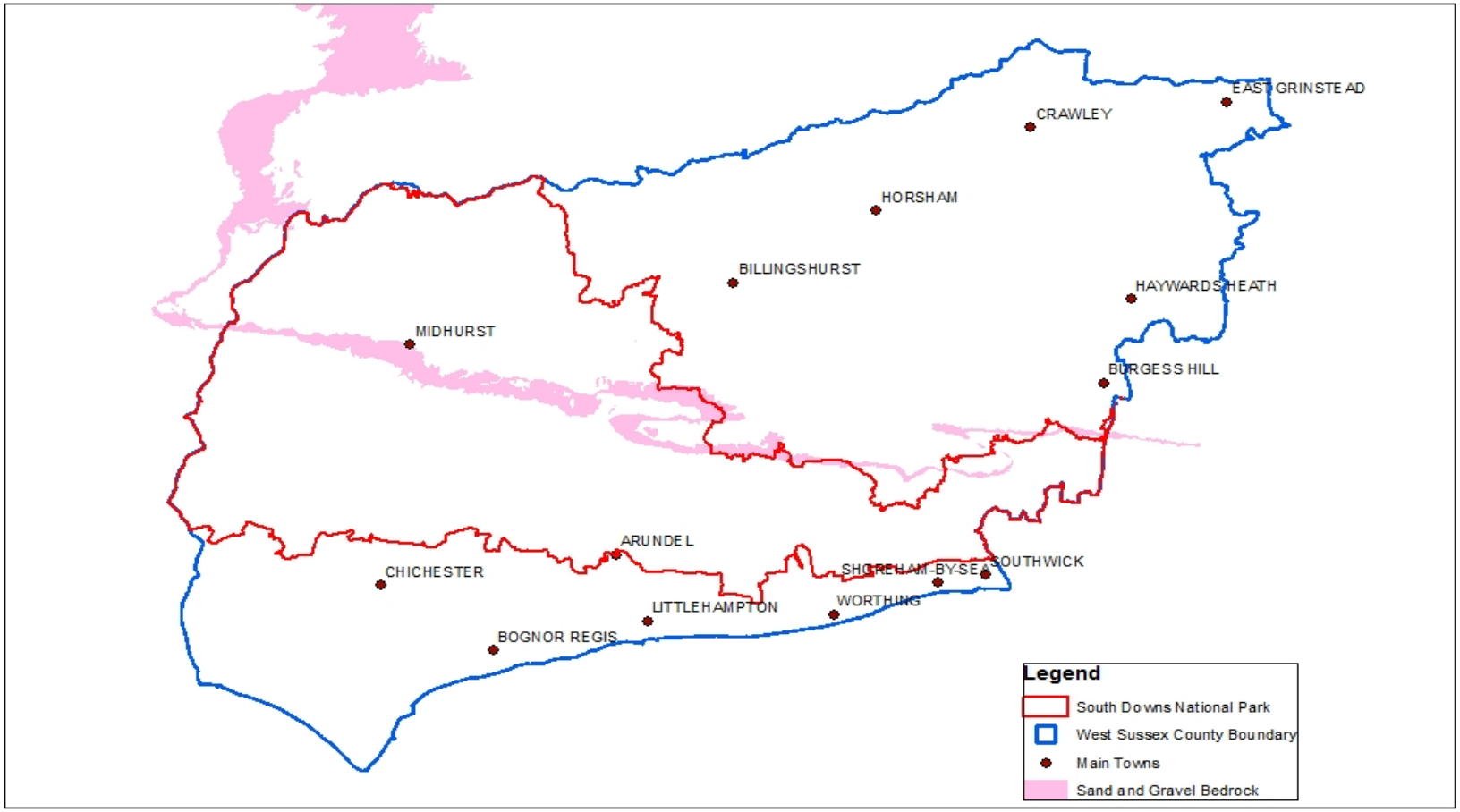


Sand and Gravel Superficial Resources in West Sussex

1:339,010

N

APPENDIX 1d: Mineral Resources in the Plan area- SAND AND GRAVEL BEDROCK



Sand and Gravel Bedrock Resources in West Sussex

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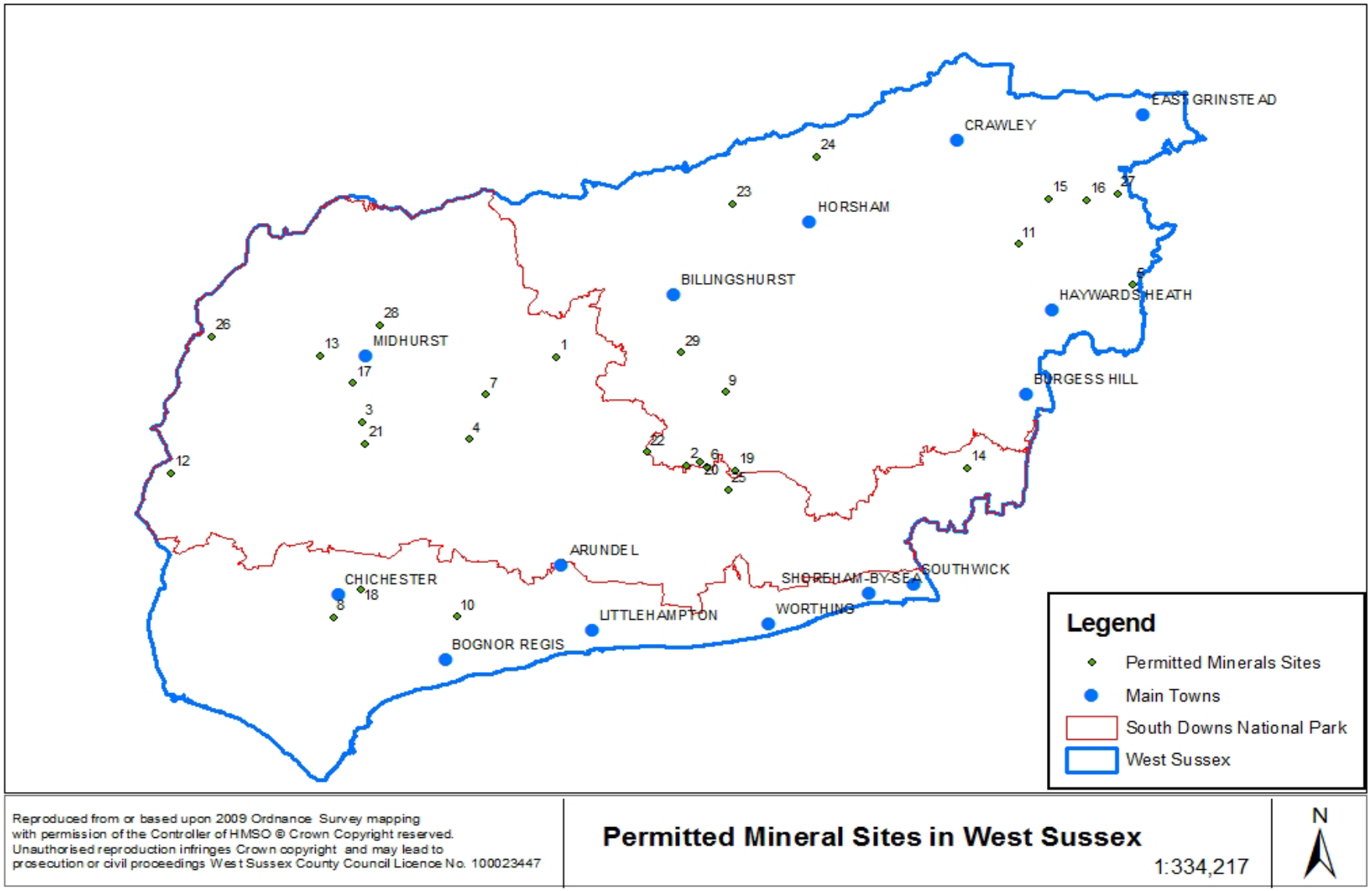
N

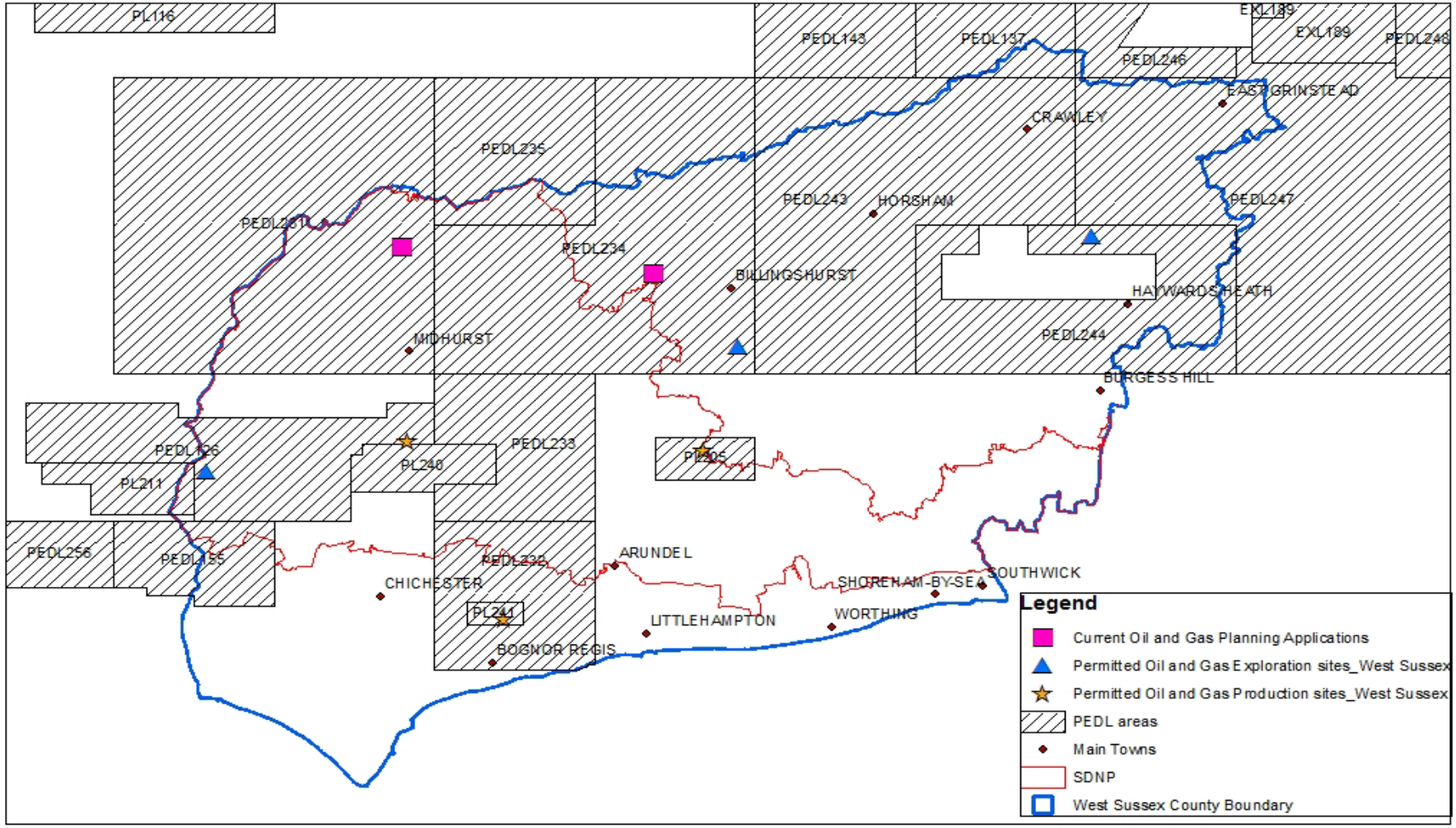
APPENDIX 2: Map of permitted mineral sites- see overleaf for key



Site reference number	Site Name	Mineral type / activity	SDNPA / WSCC	Active / Inactive
1	Bognor Common Stone Quarry	Sandstone	SDNPA	Active
2	Chantry Lane Quarry	Sand	WSCC	Inactive
3	Cocking Lime Works	chalk	SDNPA	Inactive
4	Duncton Chalk Quarry	chalk	SDNPA	Active
5	Freshfield Lane Brickworks	Clay	WSCC	Active
6	Hampers Lane Sandpit	Sand	WSCC	Active
7	Heath End	Sand	SDNPA	Active
8	Kingsham	Gravel	WSCC	Not yet commenced
9	Laybrook Brickworks	Clay	WSCC	Active
10	Lidsey Oil Site	Oil production	WSCC	Active
11	Lower Stumble Wood	Oil Exploration	WSCC	Permitted May 2014
12	Markwells Wood	Oil Exploration	SDNPA	Active
13	Minsted Sandpit	Sand	SDNPA	Active
14	Newtimber Chalk Works	Chalk	SDNPA	Active
15	Paddockhurst Stone Pit	Sandstone	WSCC	Inactive
16	Philpotts Quarry	Sandstone	WSCC	Active
17	Pitsham Brickworks	Clay	SDNPA	Active
18	Portfield Quarry	Recycling	WSCC	Active
19	Rock Common Sandpit	Sand	WSCC	Active
20	Sandgate Park Quarry	Sand	WSCC	Active
21	Singleton Oilfield	Oil Production	SDNPA	Active
22	Storrington Oilfield	Oil Production	WSCC	Active
23	Theale Farm Stone Quarry	Sandstone	WSCC	Active
24	Warnham and Wealden Brickworks	Clay	WSCC	Active
25	Washington Chalk Quarry	Chalk	SDNPA	Inactive
26	West Heath Quarry	Sand	SDNPA	Active
27	West Hoathly Brickworks	Clay	WSCC	Active
28	Winter's Pit	Sandstone	SDNPA	Active

Site reference number	Site Name	Mineral type / activity	SDNPA / WSCC	Active / Inactive
29	Wood Barn Farm	Oil Exploration	WSCC	Inactive

APPENDIX 3: Petroleum Exploration and Development Licence areas and Oil and Gas sites in West Sussex



Petroleum Exploration and Development Licence areas in West Sussex

1:338,448

N