Minerals Local Plan Background Document

Worcestershire Local Aggregate Assessment

Data covering the period up to 31/12/2016

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1. Executive Summary

1.1. There is a lack of data about the contribution that substitute or secondary and recycled materials and minerals waste make to the supply of aggregate materials in Worcestershire. This LAA assumes that the contribution of substitute, secondary and recycled materials is already accounted for prior to considering the sales figures for primary aggregates.

1.2. There are two distinct types of sand and gravel deposits in Worcestershire: the bedrock deposit solid sands of the Kidderminster Formation and Wildmoor Formation, and the surface river terrace deposits of the rivers Severn and Avon and glacial deposits found in association with boulder clay. The following bedrock mineral deposits are believed to be the only strata in the county that have been worked to produce crushed rock aggregates: the Precambrian "Malverns Complex" and "Warren House Formation", the Silurian "Woolhope Limestone Formation"[1], the Ordovician "Lickey Quartzite Formation"; and the Jurassic "Inferior Oolite Group".

1.3. There is not sufficient evidence to suggest that the production guideline for primary sand and gravel should vary from the 10 year average shown in the LAA dashboard below. The landbank for sand and gravel currently meets the requirement of 7 years. However, as of December 2016 there was only one further planning application pending and no other remaining site allocations in the adopted Minerals Local Plan, indicating a significant risk that this landbank could diminish significantly before other planning permissions are secured. Work is well underway on a new Minerals Local Plan to address this, although the minerals industry has indicated that there are likely to be significant constraints on finding sites of sufficient size and quality in the county in future.

1.4. Worcestershire has no permitted reserves, no productive capacity and no landbank for crushed rock and crushed rock resources have significant environmental constraints. Following Duty to Cooperate discussions, this LAA therefore concludes that the production guideline for crushed rock in Worcestershire should be reduced from the 10 year average to 0 tonnes per annum.

[1] Silurian "Aymestry Limestone Formation" deposits have also been worked in the past, but these are not considered to be a significant resource under the methodology set out in the background document *Analysis of Mineral Resources in Worcestershire* (available at www.worcestershire.gov.uk/mineralsbackground)

LAA Dashboard

🡻 Indicates a decrease in comparison to the figure in the previous year's LAA.
🡹 Indicates a decrease in comparison to the figure in the previous year's LAA.
- Indicates no change in comparison to the figure in the previous year's LAA.

		Sand and gravel	Crushed rock
Production (demand)	**2016 sales**	0.399 million tonnes 🡻	0 tonnes -
	3-year average sales (mean)	0.485 million tonnes 🡻	0 tonnes -
	10-year average sales (mean)	0.607 million tonnes 🡻	0.026 million tonnes 🡻
	'Baseline' production guideline identified in adopted Minerals Local Plan	N/A	N/A
	Annual Production Guideline	**0.607 million tonnes** 🡻	**0 tonnes** -
	Informatives	Production guideline based on 10-year average. No other relevant local information which indicates deviation from this average is required.	Significant constraints on delivering crushed rock production, and lack of sites being put forward by industry, indicate deviation from 10 year average is appropriate.
Landbank (Supply)	**Permitted Reserves at 31st December 2016**	4.244-4.294 million tonnes 🡹	0 tonnes -
	Number of sites at 31st December 2016	6 sites: • 3 "active" sites (permitted extension at one site) • 2 "inactive" sites • 1 new permitted site (not commenced)	0 sites -
	Landbank at 31st December 2016 (based on annual production guideline)	**6.99-7.07 years** 🡹	**0 years** -
	Landbank requirement	7.00 years ✓	10.00 years -
	Informatives	4.7-5.8% of reserves in "inactive" sites. Planning application pending for one further site.	Discussions with the West Midlands, East Midlands, South West and South Wales Aggregate Working Parties concluded that Worcestershire's production guideline for crushed rock should be reduced to 0 tonnes, but with the emerging Minerals Local Plan providing a policy framework which could enable crushed rock development to take place. The Mineral Planning Authorities and Aggregate Working Parties have indicated that supplying Worcestershire's demand for crushed rock can be accommodated.

Contents

2. Introduction

> "*Minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs. However, since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them to secure their long-term conservation.*"
> National Planning Policy Framework (2012), paragraph 142

2.1. The National Planning Policy Framework[2] requires Minerals Planning Authorities (MPAs) to plan for a steady and adequate supply of aggregates by:

- preparing an annual Local Aggregate 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)*",
- "*participating in the operation of an Aggregate Working Party and taking the advice of that Party into account when preparing their Local Aggregate Assessment*", and
- "*making provision for the maintenance of landbanks of at least 7 years for sand and gravel and at least 10 years for crushed rock*".

2.2. The LAA is an assessment of the demand for and supply of aggregates in the county. Its prime purpose is to assist MPAs in their efforts to provide for the steady and adequate supply of local aggregates, where reasonable and practicable to do so. It will inform the Minerals Local Plan and will be a material consideration in the determination of planning applications.

2.3. A separate background document has been prepared to set out how the Council will approach the issue of the steady and adequate supply of industrial and energy minerals[3].

[2] Department for Communities and Local Government (March 2012) *National Planning Policy Framework*, paragraph 145
[3] Worcestershire County Council (2015) *Ensuring Adequate and Steady Supply of Industrial and Energy Minerals*, available at www.worcestershire.gov.uk/mineralsbackground

Next steps

2.4. The Local Aggregate Assessment will be updated annually in consultation with the West Midlands Aggregate Working Party (WM AWP) and other AWPs as required, and will be published by the Council as part of the Minerals and Waste Local Development Scheme Authority Monitoring Report (AMR) in December each year. The current and previous AMRs are available on www.worcestershire.gov.uk/AMR. If you would like to be notified when new AMRs are published please contact minerals@worcestershire.gov.uk providing your contact details[4].

[4] See http://www.worcestershire.gov.uk/info/20014/planning/1156/get_involved_in_planning

3. Secondary and recycled aggregates in Worcestershire

3.1. National policy states that, so far as practicable, planning authorities should "*take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials*".[5]

Substitute materials

3.2. The use of substitutes will vary depending on individual development proposals. Their use is likely to be more strongly influenced by sustainable design and construction policies in Local Plans rather than the Minerals Local Plan.

3.3. There is no data available to indicate the level of contribution made by substitute materials.

Secondary aggregates

3.4. Secondary aggregates is a term often used to describe mineral that is produced as a by-product of other mining or quarrying activities or as a by-product of an industrial process.

3.5. There were no industrial processes in Worcestershire in 2016 which were known to produce secondary aggregates. However, there is potential for some provision of secondary aggregates in the future:

- An Energy from Waste Plant was under construction during 2016 at Hartlebury, near Kidderminster[6] (it commenced operation in 2017). This plant is predicted to produce 40,000 tonnes per annum of incinerator bottom ash which may be capable of being used as secondary aggregate, although further processing would be required to enable this.
- An application for an Incinerator Bottom Ash Processing and Recovery Facility at Hill and Moor Landfill Site[7] was under consideration in 2016 (planning permission was granted in January 2017). This facility is tied to the life of the Hill and Moor Landfill Site and is limited to processing 50,000 tonnes per annum of Incinerator Bottom Ash.

3.6. A separate application for a facility to process 120,000 tonnes per annum of incinerator bottom ash at Veolia's Sandy Lane site near Bromsgrove[8] was noted in the previous Local Aggregates Assessment. This application was refused in November 2016 for reasons of harm to the Green Belt,

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[5] Department for Communities and Local Government (March 2012) *National Planning Policy Framework*, paragraph 143

[6] Further information about the development of the Energy from Waste Plant can be viewed at http://www.severnwaste.com/recovery/envirecover-project/

[7] Planning application 16/000032/CM.

[8] Planning application 13/000027/CM.

inappropriate location contrary to Policy WCS 6 of the Waste Core Strategy, and unacceptable impact upon the open countryside.

Recycled aggregates

3.7. Recycled aggregates arise from several sources, notably construction and demolition waste (C&D waste) such as the demolition of buildings, asphalt planings from road resurfacing, recycled glass, recycled tyres, and railway track ballast. "Recycling" aggregates involves the processing of waste materials to remove unwanted or inappropriate material such as fines, wood, plastic and metal. It will usually include crushing and screening. The recycled aggregate is then re-used, usually for a less demanding application.

3.8. The supply of recycled materials will depend on the county's capacity to process these materials. The Waste Core Strategy[9] sets targets for capacity at static plant, but due to data limitations it is not possible to monitor the role of mobile plant.

3.9. There are no reliable assessments of C&D arisings or set approaches for making estimates about waste arisings or projecting waste growth for C&D waste, nationally or locally. The method used to establish projections in the Waste Core Strategy assumes that development would initially be concentrated on previously developed (brownfield) land which would generate considerable volumes of C&D waste, and that over time more new development would take place on greenfield sites resulting in the amount of C&D waste decreasing. The projected arisings of C&D waste in Worcestershire based on this approach are set out in Table 1.

Table 1. Projected Arisings of Construction and Demolition Waste (Worcestershire Waste Core Strategy)

	2010	2015	2020	2025	2030
Projected arisings of C&D waste	510,555	419,520	419,520	419,520	419,520

3.10. The Waste Core Strategy makes provision for at least 25% of the capacity to manage this waste to be met from static sites. Static facilities in Worcestershire received approximately 44,000 tonnes of inert waste for treatment in 2016, with a further 98,000 tonnes received for transfer.[10] It is not currently possible to assess the proportion of this which was subsequently sold or used as recycled aggregate.

3.11. Mobile processing and re-use on site is common at construction sites across the county, although no data is available about the volume processed by mobile plant.

[9] The Waste Core Strategy for Worcestershire was adopted in November 2012. The relevant documents are available to view on www.worcestershire.gov.uk/wcs.
[10] Environment Agency Waste Data Interrogator 2016, interrogated for treatment and transfer facilities for inert waste received in Worcestershire.

3.12. Worcestershire does not have any rail depot for the import or export of minerals (including secondary and recycled materials). Water transportation takes place on the River Severn, but this is limited to moving "as-dug" primary aggregates from one site in Worcestershire to processing plant at another. The wharves at these sites therefore do not currently enable imports or exports of minerals. It is therefore concluded that all imports and exports currently take place by road transport.

Potential to increase contribution from secondary and recycled materials

3.13. Despite the current lack of information on the level of use of secondary and recycled materials locally, these account for 29% of the total market nationally.[11]

3.14. It is likely that up to 50,000 tonnes of incinerator bottom ash will be processed at the Hill and Moor Facility to recover metals, which can be recycled, and also separate the remaining material into various grades which have the potential to be used as a secondary aggregate in the construction industry. The IBA aggregate can be used in road sub-base, bulk fill, asphalts, foamed concrete, and cement bound materials.

3.15. We are not aware of any other potential drivers that would result in significant increases in arisings or recovery for recycled or secondary aggregate materials. We also have no evidence to indicate whether Worcestershire is likely to produce any more or any less than the national average.

3.16. The Mineral Products Association's evidence to the examination in public of the Staffordshire Minerals Local Plan in 2016 states that:

"*secondary sources benefit from significant fiscal advantages over primary materials in the form of exemptions from the Aggregates Levy and avoidance of the Landfill Tax. As such, they will continue to be much cheaper than primary materials and thus favoured where specifications can accommodate them. Moreover, the [Mineral Products Association]'s members invariably offer a range of products including primary and secondary materials to customers so the [minerals planning authority] can have the assurance that the industry is not needlessly extracting primary materials when secondary materials will do the job just as well.*

Arisings of secondary materials will continue to rise and fall with economic conditions in the same way that demand for primary materials varies. Therefore, the two types of material will parallel each other and we expect the level of use of recycled and secondaries to remain broadly at the current level of 28 - 29% of total consumption. Given this any increase in

[11] Mineral Products Association (2015) *The Mineral Products Industry at a Glance*, page 7, http://www.mineralproducts.org/documents/Mineral_Products_Industry_at_a_Glance_2015.pdf. 60 million tonnes of secondary & recycled material out of a total aggregates supply market of 209 million tonnes (28.7%).

primary mineral extraction activity will not be at the expense of secondary usage."[12]

3.17. The Minerals Local Plan will give (and the Waste Core Strategy already gives) policy encouragement to increasing the use of secondary and recycled materials. However, the lack of data will make this difficult to monitor at the local level, and the evidence above from the Minerals Products Association indicates that this Local Aggregates Assessment should not rely on any significant alterations to the proportion of supply.

3.18. On this basis, this LAA assumes that the contribution of substitute, secondary and recycled materials is already accounted for prior to considering the sales figures for primary aggregates.

[12] Mineral Products Association's written statement for day 1 of the Staffordshire Minerals Local Plan examination in public. Response to question 3 in document WS.05 in the examination document library, http://www.staffordshire.gov.uk/environment/planning/policy/NewMineralsLocalPlan/Minerals-Policy-Document-Library.aspx

4. Marine sand and gravel

4.1. Sand and gravel deposits occur in many offshore areas around Britain. Most dredging takes place in coastal waters less than 25 km offshore and in water depths of between 18 m and 35 m. Marine aggregates can have special qualities which meet particular specifications.

4.2. Worcestershire is an inland county and as such has no marine resources. There are also no ports that land marine-won aggregate in the county. However, national surveys indicate that a relatively small amount of marine sand and gravel is imported into Worcestershire:

- 2,000 tonnes in 2014[13]
- 13,000 tonnes in 2009[14]
- 12,000 tonnes to Herefordshire and Worcestershire together in 2005[15].

4.3. As an inland county, the Worcestershire Minerals Local Plan cannot make provision for the production of marine sand and gravel. We have no evidence that there is a particular demand for marine-dredged aggregates in Worcestershire, and it is likely that this relatively low level of imports is simply a normal function of the commodities market for aggregates.

4.4. Worcestershire does not have any rail depot for the import or export of minerals. Water transportation takes place on the River Severn, but this is currently limited to moving "as-dug" primary aggregates from one site in Worcestershire to processing plant at another. The wharves at these sites therefore do not currently enable imports or exports of minerals. It is therefore concluded that all imports and exports currently take place by road transport.

[13] Department for Communities and Local Government, British Geological Survey, Welsh Assembly Government (2016) *Collation of the results of the 2014 aggregate mineral survey for England and Wales*.
[14] Department for Communities and Local Government, British Geological Survey, Welsh Assembly Government (October 2011) *Collation of the results of the 2009 aggregate mineral survey for England and Wales*.
[15] Department for Communities and Local Government (May 2007) *Collation of the results of the 2005 aggregate mineral survey for England and Wales*.

5. Primary Aggregates: Sand and Gravel

5.1. There are two distinct types of sand and gravel deposits in Worcestershire:

- Bedrock deposits: solid sands of the Kidderminster Formation and Wildmoor Formation
- Surface deposits: river terrace deposits of the rivers Severn and Avon and glacial deposits found in association with boulder clay.

5.2. The solid sands, river terrace and glacial deposits will be considered collectively under the term "sand and gravel" in the rest of this report.[16]

Estimating demand

10 years sales average

5.3. The starting point for setting a production guideline for sand and gravel in the LAA is to estimate demand on the basis of a rolling average of 10 years sales data (the 10-year average) before considering other relevant local information.

5.4. Table 2 and Figure 1 show the levels of sand and gravel sales in Worcestershire and Herefordshire over the last 10 years (from 2007 onwards). Worcestershire's data was combined with Herefordshire in 2012 and 2013 due to issues of commercial confidentiality[17]. Permission was given by the affected operator in Herefordshire to enable the data to be shown separately again in 2014 and 2015[18].

5.5. The most recent data available is for 2016.

Table 2. Sand and gravel sales 2007 – 2016 (million tonnes)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Worcestershire	0.81*	0.76*	0.52*	0.62*	0.63*	-	-	0.520*	0.538	0.399
Herefordshire & Worcestershire Combined						0.62*	0.659*			

Source: West Midlands Aggregate Working Party Annual Reports[19]. Data for sales in 2012-2013 combined for Herefordshire and Worcestershire due to confidentiality requirements.
* Includes estimated sales data for some sites.

5.6. In 2016, sales of sand and gravel in Worcestershire were 0.399 million tonnes.

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[16] For further information about the nature, location and potential significance of the deposits see background document *Analysis of Mineral Resources in Worcestershire* at www.worcestershire.gov.uk/mineralsbackground

[17] Long-standing confidentially arrangements agreed between the industry and government to protect operators' commercial interests. This means that sales data will not be released or published where there are fewer than 3 operational sites in an area unless express permission is given by the operators affected. From 2012 onwards there has been fewer than 3 operational sites in Herefordshire.

[18] Permission given by Tarmac in email dated 4th July 2016.

[19] Data for all West Midlands Mineral Planning Authorities is available in the West Midlands Aggregate Working Party Annual Reports at https://www.gov.uk/government/collections/aggregates-working-parties-annual-reports

5.7. The 10 year average of sales from 2007-2016 including combined data for 2012-13 is 0.607 million tonnes. This is 52% higher than the 2016 sales figure.

5.8. The 10-year average has a number of weaknesses that make sole reliance on it undesirable:

- sales will vary depending on both supply and demand factors in the market, and basing a production guideline on this alone could risk following historical trends rather than meeting future demand;
- it incorporates combined data with Herefordshire which could skew the average;[20]
- it includes data from a period of significant economic downturn and therefore may not represent the demand likely to be experienced as the economy recovers; and
- the adopted Minerals Local Plan was beyond its expected implementation period, with a limited number of Preferred Areas and saved policies, which could have limited operator interest in bringing sites forward in Worcestershire during this time, thereby depressing the annual sales figure.

5.9. Therefore, whilst the 10-year average is considered to be the best starting point, it needs to be sense-checked against other indicators.

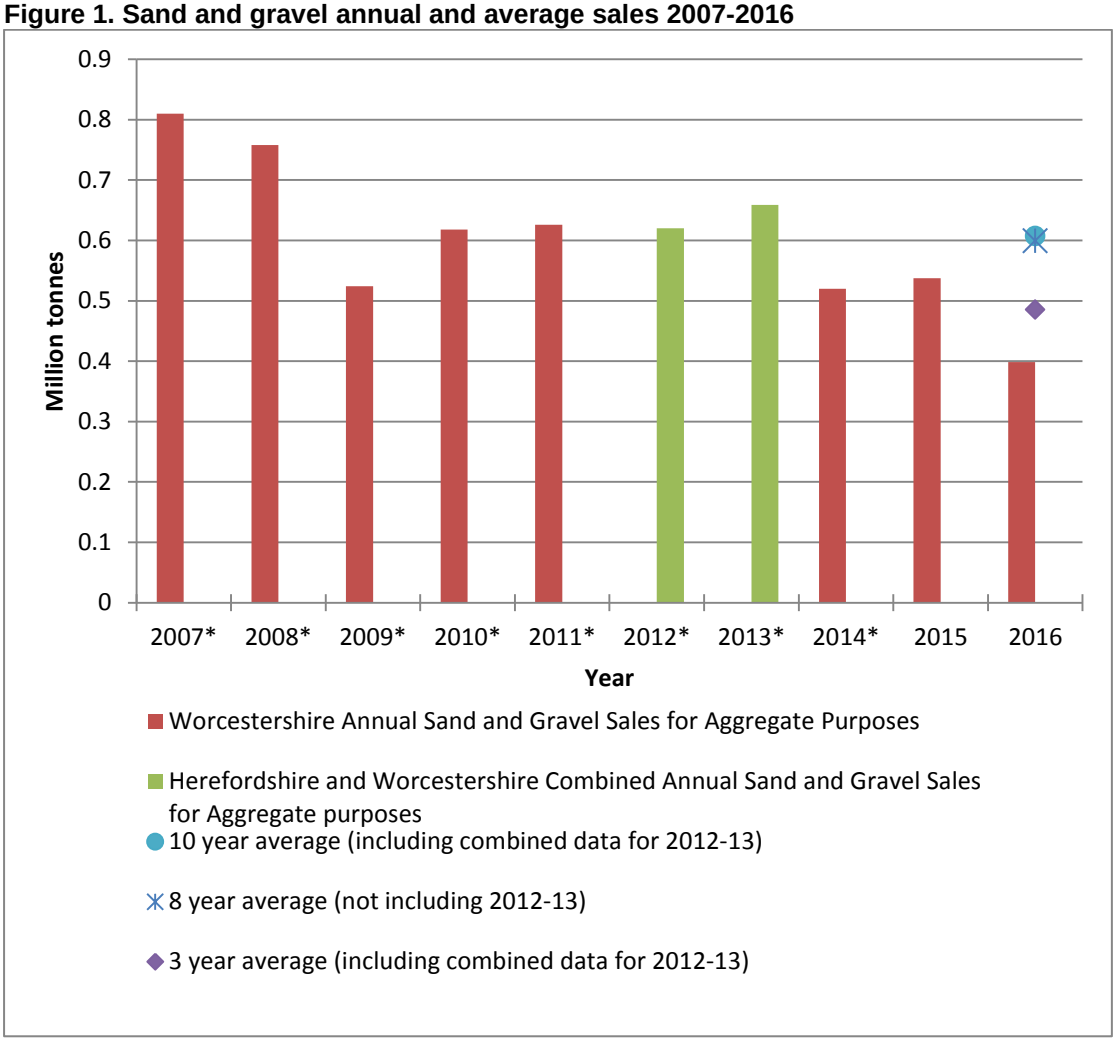
3 year sales average

5.10. An average of the last 3 years sales gives an indication of the most recent sales trends to identify the general trend of demand.

5.11. The 3 year average from 2014-2016 is 0.485 million tonnes. This is 20% lower than the 10 year average, but 22% higher than the 2016 sales figure. The difference between this 3 year average and the 10 year average is fairly significant. However it is understood that a number of the sites in Worcestershire were coming towards the end of their life in 2016 and production at those sites was slowed to ensure continuity as new planning permissions were being sought, rather than necessarily being an indication of lower demand. For these reasons, it would not be appropriate to reduce the production guideline in this LAA below the 10 year average on the basis of the three year average.

[20] If we were to discount the combined data for 2012 and 2013, the average over the 8 remaining years between 2007-2016 is 0.599 million tonnes.

Figure 1. Sand and gravel annual and average sales 2007-2016



* Years marked * include estimated sales data for some sites.

Sub regional apportionment

5.12. A further indicator to be taken into account is the sub-regional apportionment derived from the *National and regional guidelines for aggregates provision in England*.[21] These guidelines were produced to cover the period 2001-2016 and updated for the period 2005-2020 and set out the level of provision which should be made by each Region. An annual "sub-regional apportionment" was derived from the 2001-2016 Guidelines, and for Worcestershire this was 0.871 million tonnes of sand and gravel. No sub-regional apportionment based on the 2005-2020 Guidelines has been agreed.

5.13. The sub-regional apportionment was 118% higher than the 2016 sales figure and this level of production has not been achieved in Worcestershire since 2003.

[21] Department for Communities and Local Government https://www.gov.uk/government/publications/national-and-regional-guidelines-for-aggregates-provision-in-england-2005-to-2020

5.14. In the Inspector's Report on the partial review of the Northamptonshire Minerals and Waste Local Plan,[22] the Inspector stated "as they (*the national guidelines*) were based on production before the recession and within a different policy context, it would not be prudent to accord them very significant weight."

5.15. This suggests that it would not be appropriate to increase the production guideline in this LAA above the 10 year average on the basis of the *National and regional guidelines* or the sub-regional apportionment.

Factors which might influence demand

5.16. Considering levels of planned development could provide an indication of whether demand for sand and gravel is likely to significantly increase or decrease, warranting an adjustment in the production guideline.

Housing development

5.17. Figure 2 shows sand and gravel sales against housing completions in the county over the last 10 years. This does not indicate a direct correlation between housing completions and the level of sand and gravel sales.

5.18. Figure 2 shows that the level of housing completions has varied annually over the last 10 years (between 1,090 and 2,090), with an average of 1,529 completions per year[23]. Over the next 10 years, the anticipated level of housing provision is approximately 2218 dwellings per year.[24] If delivered as anticipated, this represents a 35% increase on the average over the last 10 years and is higher than the number of actual completions seen in 2015/16. A steady and adequate supply of aggregates, including sand and gravel, will be crucial to enabling the level of planned housing development to be delivered.

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[22] The Planning Inspectorate (August 2014) *Report on the Examination into the Northamptonshire Minerals and Waste Local Plan (Northamptonshire Minerals & Waste Development Framework Partial Review)* http://www3.northamptonshire.gov.uk/councilservices/environment-and-planning/planning/planning-policy/minerals-and-waste-planning-policy/documents/PDF%20Documents/ReportToNorthamptonshireCountyCouncilV3.pdf

[23] Department for Communities and Local Government, statistical data set "Live tables on house building: new build dwellings" table 253 (permanent dwellings started and completed, by tenure and district). https://www.gov.uk/government/statistical-data-sets/live-tables-on-house-building. Dataset incomplete for 2009-10 and 2010-11.

[24] Based on figures in South Worcestershire Development Plan (2016), Wyre Forest Core Strategy (2010), Bromsgrove District Plan (2017) , and Borough of Redditch Local Plan No.4 (2017)

Figure 2. Sand and gravel sales versus housing completions[25]

5.19. The British Geological Survey states that the construction of a typical new house uses approximately 60 tonnes of aggregates from the foundations through to the roof tiles.[26] This is a generalisation which must be treated with a degree of caution and it does not distinguish between use of sand and gravel and crushed rock. However, multiplying this figure with housing completions indicates that the proportion of sand and gravel sales which might be attributable to new houses is variable, ranging from 8.5% to 29%. This does not include any requirements for infrastructure supporting housing development or the significant amount used in maintaining or refurbishing existing housing stock. Estimates of the amount of mineral resource required per house when supporting infrastructure, such as access roads, is taken into account (averaged per house on the development) ranges between 200

[25] Housing completions data based on Department for Communities and Local Government, statistical data set "Live tables on house building: new build dwellings" table 253 (permanent dwellings started and completed, by tenure and district). https://www.gov.uk/government/statistical-data-sets/live-tables-on-house-building. Dataset incomplete for 2009-10 and 2010-11.

[26] British Geological Survey (2008) The need for indigenous aggregates production in England. https://www.bgs.ac.uk/downloads/start.cfm?id=1373

tonnes[27] and 400 tonnes[28]. Alongside other development's mineral requirements, this is likely to account for the rest of Worcestershire's production. There are no figures available to indicate the level of demand other types of development might create.

5.20. Whilst there is a clear ambition for an increased level of housebuilding over the coming years, it is not possible to robustly quantify the level of demand for aggregate resources which this might create. As it is not clear whether or not this could be met by supply in line with the 10 year average, it would not be appropriate for the production guideline in this LAA to deviate from the 10 year average on the basis of projected housing numbers.

Other development

5.21. It is recognised that significant levels of commercial and other development is proposed in the Local Plans and Strategic Economic Plans in and around Worcestershire. In addition, the Nationally Significant Infrastructure Project "Redditch Branch Enhancement Scheme"[29] may create some demand for aggregate minerals from within Worcestershire.

5.22. However, the lack of data to estimate the level of demand for aggregate resources which these forms of development might create indicates that it would not be appropriate for the production guideline in this LAA to deviate from the 10 year average on the basis of other development.

Supply options / constraints

Indigenous supply

Worcestershire's sand and gravel resources

5.23. There are two estimates of the quantity of sand and gravel resources which exist in Worcestershire.

5.24. The "Sub-Regional Apportionment of Aggregates Provision in the West Midlands Region 2005 – 2020 Consultation paper 17-02-2010" document was prepared for the West Midlands Regional Assembly by Land Use Consultants in February 2010. This used the British Geological Survey (BGS) mineral resource dataset (1:50,000) as the starting point for the distribution of resources in the region in GIS, and then applied the following factors which were considered to sterilise the resource:

- The road network – based on the Primary Road Network with a 5m buffer of the line features in GIS to approximate the footprint on the ground;

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[27] Mineral Products Association (2016) The Minerals Products Industry at a Glance. http://www.mineralproducts.org/documents/Mineral_Products_Industry_At_A_Glance_2016.pdf

[28] British Geological Survey (2008) The need for indigenous aggregates production in England. https://www.bgs.ac.uk/downloads/start.cfm?id=1373

[29] The Redditch Branch Enhancement Scheme is intended to create capacity along the single track to Redditch through the construction of a dynamic loop, consisting of approximately 3km of double track and 2 connections to the original track, allowing trains to pass one another. Consent for this scheme was granted in 2013.

- Railways – based on railway data supplied by WMRA with a 5m buffer of the line features in GIS to approximate the footprint on the ground;
- Urban areas – based on the 2001 Census Urban Areas dataset; and
- Worked-out sites – based on information provided by mineral planning authorities (no GIS data on historical sites in Worcestershire was available at that time).

5.25. All international nature conservation and heritage designations were also removed to reflect the level of protection that international designations are afforded by the Planning system, and the Malvern Hills Conservators landholdings were also removed due to the restrictions on quarrying imposed by the Malvern Hills Acts.

5.26. A mean working thickness for each deposit type in each sub-region was derived and these were applied to the remaining areas of each mineral deposit to convert the area (ha) to a volume (mt) using a bulk density figure of 1675kg/m^3 for sand and gravel.

5.27. Worcestershire County Council (WCC) has since undertaken its own analysis of the mineral resources in the county.[30] This is also based on the BGS 1:50,000 GIS data, applying minimum size thresholds for the deposits considered (>10ha in area and >200m wide), and analysing BGS memoirs and planning histories to estimate the likely depth of each deposit. A conversion factor of 1.65t/m^3 for sand and gravel was applied following consultation responses, these are considered to be broadly comparable to the bulk density figures used in the LUC report. Some consideration was given to areas sterilised by surface development, and the calculated volume was halved in estimating the available resource volume in order to recognise that some areas are overlain by dispersed development, that information about depth is limited and the quality and depth can vary across a deposit, and that constraints which will be set out in criteria-based policies have not been applied.

5.28. A comparison between the two estimates can be seen in table 3 below.

Table 3. Comparison between LUC and WCC estimates of Worcestershire's sand and gravel resources

Document estimating resource	Area of unsterilized resource (ha)	Volume of unsterilized resource (mt)
LUC	25,036.34	3,222.57
WCC Analysis of mineral resources	22,036.00	3,646.66

[30] Worcestershire County Council (August 2016) *Worcestershire Minerals Local Plan Background Document: Analysis of Mineral Resources in Worcestershire*, available at www.worcestershire.gov.uk/mineralsbackground.

5.29. The WCC figures for sand and gravel appear to be broadly comparable to those in the LUC report. Further work is currently underway to look at screening out international and national designations.

Sites and permitted reserves

5.30. Of the 5 sand and gravel sites in Worcestershire shown in Table 4, three were "active" (in production for some time during the year) and two "inactive" (worked in the past and contain permitted reserves) during 2016. As of 31st December 2016, four of these sites had permitted reserves of sand and gravel for aggregate purposes and one of the sites classed its permitted reserves as "non-aggregate uses".[31]

5.31. None of the sites has conditions attached to its planning permission which would restrict the productive capacity of the site.

Table 4. Sand and gravel sites in 2016

Site name	Company	Location	Planning permission end date
Cinetic Quarry (also known as Wildmoor Quarry)	Wildmoor Quarry Products Ltd	Sandy Lane, Wildmoor, Bromsgrove	None stipulated (therefore 2042)
Clifton	Tarmac	Clifton Arles Wood, Severn Stoke	31 December 2030 (stated on planning permission 15/000006/CM which was granted 12 July 2016, consolidating the existing quarry and new extensions into one permission)
Pinches 3 Quarry	J & V Kelly Ltd	Wildmoor Lane, Bromsgrove	30 November 2019 (08/000055)
Ryall / Ripple Quarry	Cemex UK Materials Ltd	Ryall House Farm, Tewkesbury Road, Ryall, Upton upon Severn	Ripple Quarry completed extraction in May 2015. Proposals for decommissioning and restoration of Ryall House Farm Quarry[32] required by 31 December 2023, or within 3 months of the permanent cessation of working at Ryall's Court Quarry (15/000013/CM)
Sandy Lane Quarry	Veolia ES Landfill Limited	Sandy Lane, Wildmoor, Bromsgrove	Review of Mineral Permission submission required by 20th March 2017

5.32. According to the survey returns submitted by mineral operators in the county, the total permitted reserves for sand and gravel at 31st December

[31] In the 2016 annual survey returns, one of the sites classed its permitted reserves as "non-aggregate" and therefore they have not been included in the figures for permitted reserves below, but it is possible that the material could be reclassified and sold as aggregate in future.
[32] Planning permission 15/000012/CM granted 23 May 2016 to enable the continued temporary retention of aggregate wharf and aggregates processing plant at Ryall House Farm Quarry.

2016 was 0.644-0.694 million tonnes[33]. The permitted reserves contained within sites classed as "inactive" in 2016 account for between 29-39% of these reserves.

5.33. However, additional planning permissions were granted during 2016, although these had not commenced working by 31st December 2016:

- Ryall's Court Quarry[34], Cemex UK Materials Ltd, land at Ryall's Court, Ryall Court Lane, Ryall, Upton-upon-Severn (end date 31 December 2026): 1.4 million tonnes of sand and gravel
- Clifton Quarry extension[35] to the south and east of the existing site: 2.2 million tonnes

5.34. Including these permissions, the total permitted reserves for sand and gravel at 31st December 2016 was 4.244-4.294 million tonnes. These permissions have been implemented during 2017, and it is therefore reasonable to rely on this figure for this Local Aggregates Assessment. In relation to this, the permitted reserves contained within sites classed as "inactive" in 2016 account for between 4.7-5.8% of these reserves.

Applications pending

5.35. A planning application received in 2009 (09/000085/CM) to extract 430,000 tonnes of sand and gravel from a new quarry at Strensham was subject to a holding objection from the Highways Agency and a decision was pending during 2016.[36] This site was allocated as a Preferred Area in the adopted County of Hereford and Worcester Minerals Local Plan 1997.

Site allocations

5.36. The adopted County of Hereford and Worcester Minerals Local Plan (1997) allocated a number of preferred areas for sand and gravel working in Worcestershire.

5.37. The site at Strensham, which is subject to planning application 09/000085/CM as discussed above, is the last remaining allocated site for sand and gravel extraction within Worcestershire in the adopted Minerals Local Plan, other than the extension to Aston Mill, Kemerton, which is understood to have not been worked due to the quality and quantity of the mineral deposit and part of the wider Ryall North site, which has planning permission (Application Ref: 15/000013/CM) for the majority of the Preferred Area allocation.

5.38. In addition, information received from the minerals industry and Mineral Products Association suggests that some caution should be given to the remaining Preferred Areas in the adopted 1997 Minerals Local Plan: "*if*

[33] Most sites stated a single figure for their permitted reserves, but one site stated a range.
[34] Ryall's Court Quarry was granted planning permission on 23rd May 2016 (reference 15/000013/CM).
[35] The extension to Clifton quarry was granted planning permission on 12th July 2016 (reference 15/000006/CM).
[36] Application 09/000085/CM was withdrawn in October 2017.

allocations from that Plan are still outstanding it suggests that they are undeliverable and should not be relied on"[37].

5.39. Three calls for sites had been undertaken in the development of the new Minerals Local Plan by December 2016. A number of potential sites for sand and gravel extraction have been proposed and these sites are under consideration as site allocations. The minerals industry and Mineral Products Association state that they struggle to find sand and gravel sites of sufficient size to work in Worcestershire, except as isolated satellite operations which are not long term solutions.[38] However, a fourth call for sites conducted in winter 2017/18 has resulted in additional sites being proposed. In addition, the Minerals Local Plan is being developed to enable both large sites and/or the satellite working of sites, as this may become the most sustainable way of working Worcestershire's resources in future.

Pre-application discussions

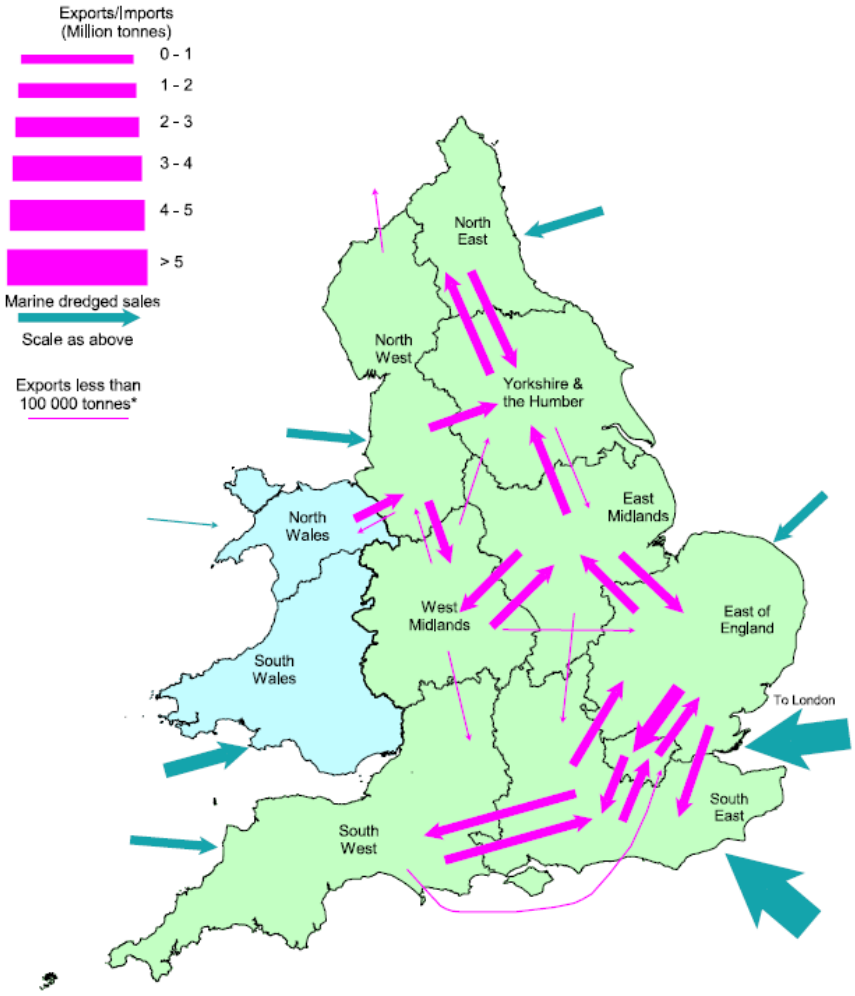
5.40. During 2016, pre-application discussions have been held with regard to two potential sand and gravel sites. These discussions are confidential and may not result in planning applications being brought forward, but they indicate that there is some interest in developing further sand and gravel workings in Worcestershire.

Imports and exports of primary aggregates

5.41. The only source of information about the flows of imports and exports of sand and gravel is the *Aggregate minerals survey for England and Wales*. This survey is undertaken about every 4 years and one aspect that it considers is the movement of material. It sets out information relating to the inter-regional flow of aggregates. The pattern of movements of sand and gravel is illustrated in Figure 3.

[37] Mineral Products Association comments on Minerals Local Plan Background Documents consultation, summer 2015 (response reference D024-1899)
[38] Mineral Products Association comments on Minerals Local Plan Background Documents consultation, summer 2015 (response reference D024-1899)

Figure 3. Sand and gravel inter-regional flows, 2014



*For clarity, exports less than 25 000 tonnes are not shown.

Source: "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016)

5.42. The data which is available for Worcestershire in the *Aggregate minerals survey for England and Wales* for 2009 and 2014 is presented in Table 5, Table 6, and Table 7. This data indicates that Worcestershire was a net exporter of sand and gravel in both years, although the proportion of imports was greater in 2014. However, discussion with the authors of the document has revealed that the information does not represent a complete dataset from all mineral operators[39]. It is therefore considered that significant caution must be applied in relying on this data. The sales figures shown in Table 2 should therefore be considered to be more reliable.

[39] Email correspondence with Mr T Bide at the British Geological Survey (7th August 2017) revealed that for 2009 responses were only received for two quarries in Worcestershire, and in 2014 for only 1 quarry.

Table 5. Exports: Sales of primary sand and gravel from Worcestershire by principal destination sub-region

	2009		2014	
Destination of sales from Worcestershire	**Tonnes of land-won sand and gravel**	**MPA %**	**Tonnes of land-won sand and gravel**	**MPA %**
Worcestershire	114,000	52%	51,000	22%
West Midlands	59,000	27%	133,000	57%
Elsewhere	45,000	21%	47,000	21%
Total	218,000	-	231,000	

Source: "*Collation of the results of the 2009 aggregate minerals survey for England and Wales*" Communities and Local Government (October 2011) table 9f and "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016) table 9f.

Table 6. Imports of primary sand and gravel in to Worcestershire

	2009	2014
Tonnes of land-won sand and gravel	45,000	146,000
Tonnes of marine sand and gravel	13,000	2,000
Total	58,000	148,000

Source: "*Collation of the results of the 2009 aggregate minerals survey for England and Wales*" Communities and Local Government (October 2011) table 10 and "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016) table 10

Table 7. Balance of sand and gravel exports and imports in Worcestershire

	Exports	Imports	Balance
2009	104,000	58,000	Net exporter (46,000)
2014	180,000	148,000	Net exporter (32,000)

Source: Based on data in "*Collation of the results of the 2009 aggregate minerals survey for England and Wales*" Communities and Local Government (October 2011) and "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016)

5.43. Information from Worcestershire's mineral operators indicates that of the sand and gravel produced in Worcestershire in 2016, 50.1% was sold within Worcestershire, 36.4% was exported to the wider West Midlands, 13.5% to the South West, and 0.01% to South Wales. There is no equivalent information available to indicate the level of imports into Worcestershire in 2016.

5.44. Worcestershire does not have any rail depot for the import or export of minerals. Water transportation takes place on the River Severn, but this is limited to moving "as-dug" material from one site in Worcestershire to processing plant at another. The wharves at these sites therefore do not currently enable imports or exports of minerals. It is therefore concluded that all imports and exports currently take place by road transport.

Conclusion: Balancing demand and supply

5.45. Considering each of the issues outlined above, whilst there is no evidence that demand for sand and gravel is likely to decrease, there is also not sufficient evidence to suggest that the production guideline should vary from the 10 year average. **The production guideline for sand and gravel identified by this Local Aggregates Assessment is therefore 0.607 million tonnes.**

5.46. Based on this production guideline and the stock of permitted reserves of 4.244-4.294 million tonnes, **Worcestershire had a landbank of 6.99-7.07 years at 31st December 2016.**

5.47. This indicates that there is currently a sufficient stock of permitted reserves in the county. However, with only one further planning application pending and no other remaining site allocations in the adopted Minerals Local Plan, there is a significant risk that this landbank could diminish significantly before other planning permissions are secured.

5.48. Work is well underway on a new Minerals Local Plan and a number of sites have been submitted for inclusion in that plan. Some of those sites may be brought forward in the near future. However, the minerals industry has indicated that there are likely to be significant constraints on finding further sites of sufficient size and quality in the county in future.

6. Primary Aggregates: Crushed Rock

6.1. The bedrock geology in Worcestershire includes the following mineral deposits which are believed to be the only strata in the county that have been worked to produce crushed rock aggregates since 1947: [40]

- The Precambrian "Malverns Complex" and "Warren House Formation";
- The Silurian "Woolhope Limestone Formation"[41];
- The Ordovician "Lickey Quartzite Formation"; and
- The Jurassic "Inferior Oolite Group".

6.2. These Precambrian, Silurian, Ordovician and Jurassic deposits will be considered collectively under the term “crushed rock” in the rest of this report.

Estimating demand

10 year sales average

6.3. The starting point for setting a production guideline for crushed rock in the LAA is to estimate demand on the basis of a rolling average of 10 years sales data (the 10-year average) before considering other relevant local information.

6.4. Table 8 and Figure 4 show the levels of crushed rock sales in Worcestershire and Herefordshire over the last 10 years (2007-2016). Worcestershire's data was combined with Herefordshire up to 2009 due to issues of commercial confidentiality[42]. Worcestershire's last crushed rock site ceased working and has been undergoing restoration since 2010.

Table 8. Crushed rock sales 2007 – 2016 (million tonnes)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Worcestershire	-	-	-	0	0	0	0	0	0	0
Herefordshire and Worcestershire Combined	0.37	0.22	0.20							

Source: West Midlands Regional Aggregate Working Party Annual Reports. Data for sales up to 2009 combined for Herefordshire and Worcestershire due to confidentiality arrangements.

6.5. In 2016, sales of crushed rock in Worcestershire were 0 tonnes.

[40] For further information about the nature, location and potential significance of the deposits see background document *Analysis of Mineral Resources in Worcestershire* at www.worcestershire.gov.uk/mineralsbackground

[41] Silurian "Aymestry Limestone Formation" deposits have also been worked in the past, but these are not considered to be a significant resource under the methodology set out in the background document *Analysis of Mineral Resources in Worcestershire* (available at www.worcestershire.gov.uk/mineralsbackground)

[42] Long-standing confidentially arrangements agreed between the industry and government to protect operators' commercial interests. This means that sales data will not be released or published where there are fewer than 3 operational sites in an area unless express permission is given by the operators affected.

6.6. Previous versions of the LAA made the assumption that a third of the combined crushed rock sales data was attributable to Worcestershire. In order to calculate the 10 year average, this assumption has been used for the combined data for 2007-2009. On this basis, the 10 year average of sales from 2007-2016 is 0.026 million tonnes.

6.7. The 10-year average has a number of weaknesses that make sole reliance on it undesirable:

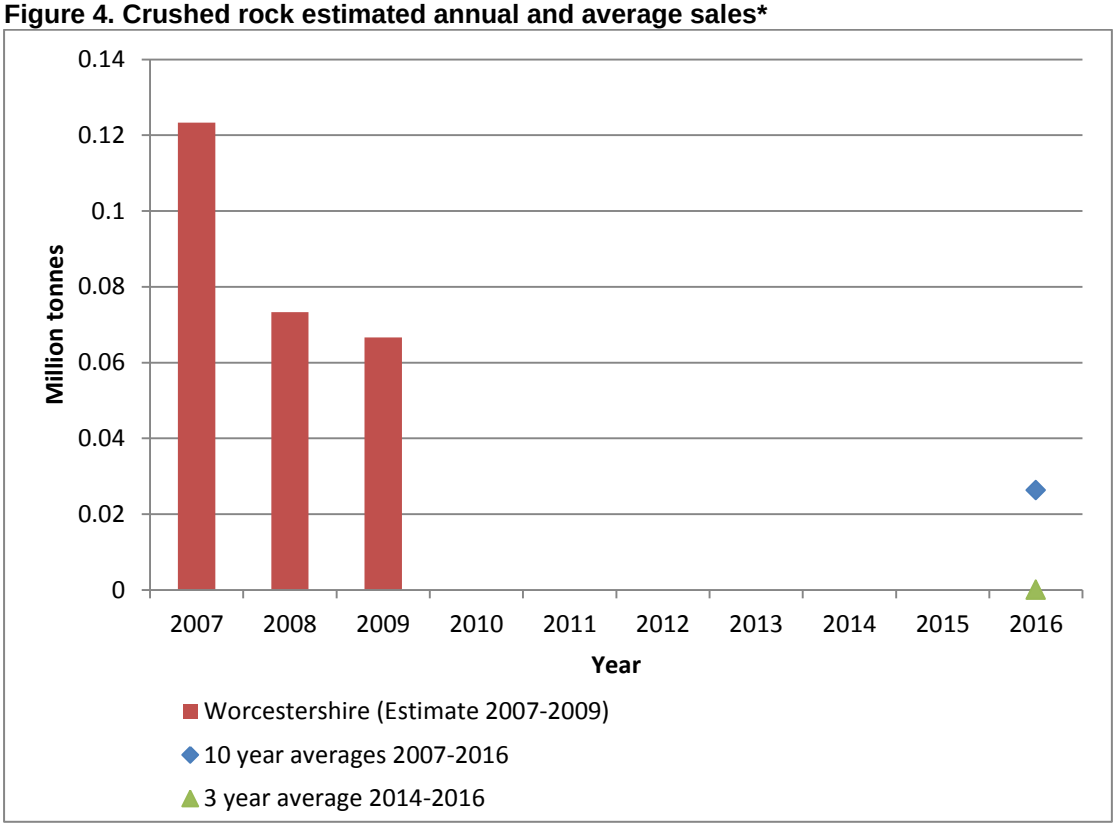
- sales will vary depending on both supply and demand factors in the market, and basing a production guideline on this alone could risk following historical trends rather than meeting future demand;
- it uses assumptions on the proportion Worcestershire contributed to the combined data with Herefordshire which makes the average somewhat unreliable;
- it includes data from a period of significant economic downturn and therefore may not represent the demand likely to be experienced as the economy recovers; and
- the adopted Minerals Local Plan was beyond its expected implementation period, with a limited number of Preferred Areas and saved policies, which could have limited operator interest in bringing sites forward in Worcestershire during this time, thereby depressing the annual sales figure.

6.8. Therefore, whilst it is considered to be the best starting point, it needs to be sense-checked against other indicators.

3 year sales average

6.9. An average of the last 3 years sales gives an indication of the most recent sales trends to identify the general trend of demand. The 3 year average from 2014-2016 is 0 tonnes, as there were no operational crushed rock sites in Worcestershire during this period. This is therefore lower than the 10 year average, but the same as the 2016 sales figure. This indicates that it may be appropriate to decrease the production guideline to less than the 10 year average.

Figure 4. Crushed rock estimated annual and average sales*



* Estimated sales based on the assumption that a third of the combined crushed rock sales from Herefordshire and Worcestershire were attributable to Worcestershire.

Sub regional apportionment

6.10. A further indicator to be taken into account is the sub-regional apportionment derived from the *National and regional guidelines for aggregates provision in England*.[43] These guidelines were produced to cover the period 2001-2016 and updated for the period 2005-2020 and set out the level of provision which should be made by each Region. An annual "sub-regional apportionment" was derived the 2001-2016 Guidelines, and for Worcestershire this was 0.163 million tonnes of crushed rock. No sub-regional apportionment based on the 2005-2020 Guidelines has been agreed.

6.11. This level of production has not been achieved in Worcestershire since 2002.

6.12. In the Inspector's Report on the partial review of the Northamptonshire Minerals and Waste Local Plan,[44] the Inspector stated “as they (*the national*

[43] Department for Communities and Local Government https://www.gov.uk/government/publications/national-and-regional-guidelines-for-aggregates-provision-in-england-2005-to-2020

[44] The Planning Inspectorate (August 2014) *Report on the Examination into the Northamptonshire Minerals and Waste Local Plan (Northamptonshire Minerals & Waste Development Framework Partial Review)* http://www3.northamptonshire.gov.uk/councilservices/environment-and-

guidelines) were based on production before the recession and within a different policy context, it would not be prudent to accord them very significant weight."

6.13. This suggests that it would not be appropriate to vary the production guideline in this LAA from the 10 year average on the basis of the *National and regional guidelines* or the sub-regional apportionment.

Factors which might influence demand

6.14. Considering levels of planned development could provide an indication of whether demand for crushed rock is likely to significantly increase or decrease, warranting an adjustment in the production guideline.

Housing development

6.15. Figure 2 shows crushed rock sales against housing completions in the county over the last 10 years. This does not indicate a direct correlation between housing completions and the level of crushed rock sales.

6.16. Figure 2 shows that the level of housing completions has varied annually over the last 10 years (between 1,090 and 2,090), with an average of 1,529 completions per year[45]. Over the next 10 years, the anticipated level of housing provision is approximately 2218 dwellings per year.[46] If delivered as anticipated, this represents a 35% increase on the average over the last 10 years and is higher than the number of actual completions seen in 2015/16. A steady and adequate supply of aggregates, including crushed rock, will be crucial to enabling the level of planned housing development to be delivered.

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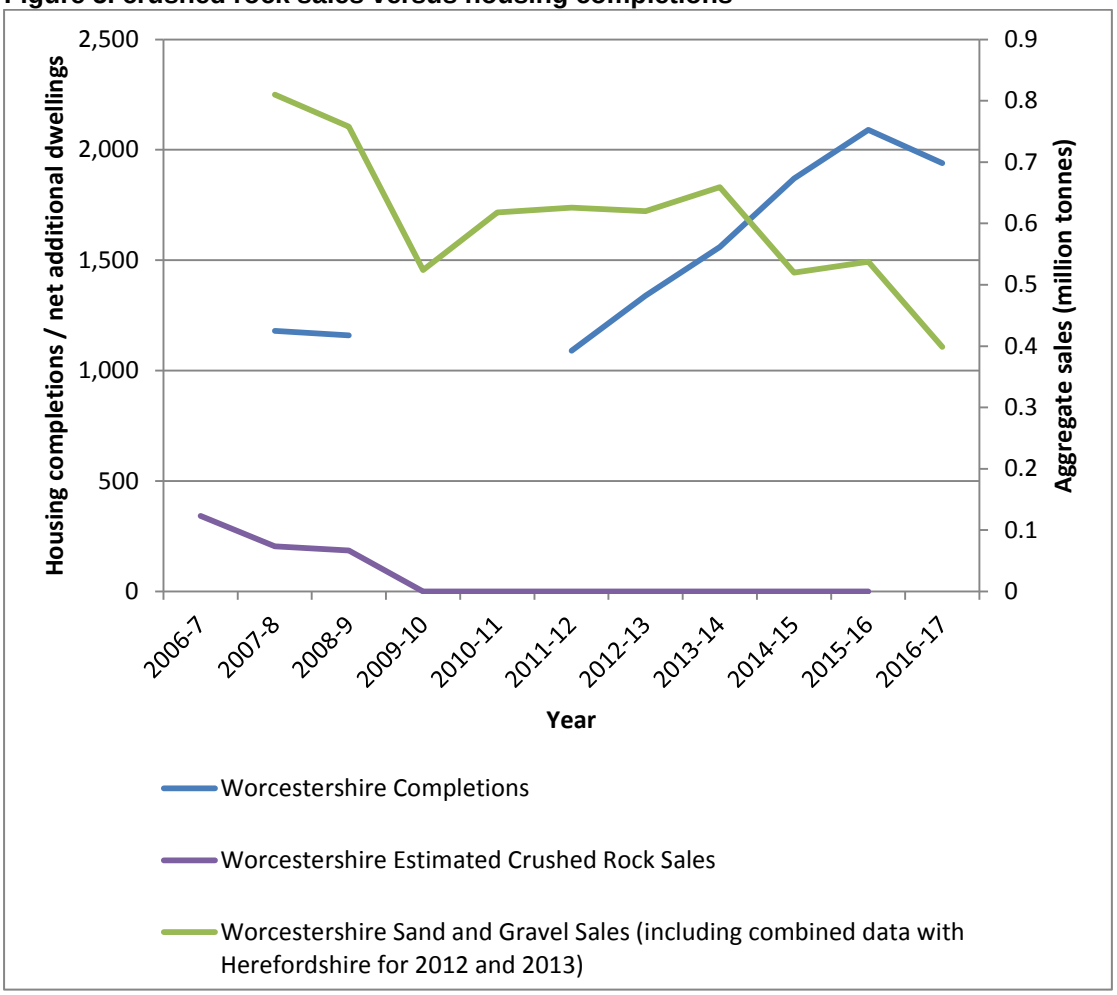
planning/planning/planning-policy/minerals-and-waste-planning-policy/documents/PDF%20Documents/ReportToNorthamptonshireCountyCouncilV3.pdf

[45] Department for Communities and Local Government, statistical data set "Live tables on house building: new build dwellings" table 253 (permanent dwellings started and completed, by tenure and district). https://www.gov.uk/government/statistical-data-sets/live-tables-on-house-building. Dataset incomplete for 2009-10 and 2010-11.

[46] Based on figures in South Worcestershire Development Plan (2016), Wyre Forest Core Strategy (2010), Bromsgrove District Plan (2017) , and Borough of Redditch Local Plan No.4 (2017)

Figure 5. crushed rock sales versus housing completions[47]



6.17. The British Geological Survey states that the construction of a typical new house uses approximately 60 tonnes of aggregates from the foundations through to the roof tiles.[48] This is a generalisation which must be treated with a degree of caution and it does not distinguish between use of crushed rock and sand and gravel. This does not include any requirements for infrastructure supporting housing development or the significant amount used in maintaining or refurbishing existing housing stock. Estimates of the amount of mineral resource required per house when supporting infrastructure, such as access roads, is taken into account (averaged per house on the development) ranges between 200 tonnes[49] and 400 tonnes[50].

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[47] Housing completions data based on Department for Communities and Local Government, statistical data set "Live tables on house building: new build dwellings" table 253 (permanent dwellings started and completed, by tenure and district). https://www.gov.uk/government/statistical-data-sets/live-tables-on-house-building. Dataset incomplete for 2009-10 and 2010-11.

[48] British Geological Survey (2008) The need for indigenous aggregates production in England. https://www.bgs.ac.uk/downloads/start.cfm?id=1373

[49] Mineral Products Association (2016) The Minerals Products Industry at a Glance. http://www.mineralproducts.org/documents/Mineral_Products_Industry_At_A_Glance_2016.pdf

[50] British Geological Survey (2008) The need for indigenous aggregates production in England. https://www.bgs.ac.uk/downloads/start.cfm?id=1373

6.18. Whilst there is a clear ambition for an increased level of housebuilding over the coming years, it is not possible to robustly quantify the level of demand for aggregate resources which this might create. Therefore, it would not be appropriate for the production guideline in this LAA to deviate from the 10 year average on the basis of projected housing numbers.

Supply options / constraints

Indigenous supply

Worcestershire's crushed rock resources

6.19. There are two estimates of the quantity of crushed rock resources which exist in Worcestershire.

6.20. The "Sub-Regional Apportionment of Aggregates Provision in the West Midlands Region 2005 – 2020 Consultation paper 17-02-2010" document was prepared for the West Midlands Regional Assembly by Land Use Consultants in February 2010. This used the British Geological Survey (BGS) mineral resource dataset (1:50,000) as the starting point for the distribution of resources in the region in GIS, and then applied the following factors which were considered to sterilise the resource:

- The road network – based on the Primary Road Network with a 5m buffer of the line features in GIS to approximate the footprint on the ground;
- Railways – based on railway data supplied by WMRA with a 5m buffer of the line features in GIS to approximate the footprint on the ground;
- Urban areas – based on the 2001 Census Urban Areas dataset; and
- Worked-out sites – based on information provided by mineral planning authorities (no GIS data on historical sites in Worcestershire was available at that time).

6.21. All international nature conservation and heritage designations were also removed to reflect the level of protection that international designations are afforded by the Planning system, and the Malvern Hills Conservators landholdings were also removed due to the restrictions on quarrying imposed by the Malvern Hills Acts.

6.22. A mean working thickness for each deposit type in each sub-region was derived and these were applied to the remaining areas of each mineral deposit to convert the area (ha) to a volume (mt) using a bulk density figure of 2600kg/m3 for hard rock.

6.23. Worcestershire County Council (WCC) has since undertaken its own analysis of the mineral resources in the county. This is also based on the BGS 1:50,000 GIS data, applying minimum size thresholds for the deposits considered (>10ha in area and >200m wide), and analysing BGS memoirs and planning histories to estimate the likely depth of each deposit. A conversion factor of 2.45t/m3 for crushed rock was applied following consultation responses, these are considered to be broadly comparable to the bulk density figures used in the LUC report. Some consideration was given to areas sterilised by surface development, and the calculated volume was halved in estimating the available resource volume in order to recognise

that some areas are overlain by dispersed development, that information about depth is limited and the quality and depth can vary across a deposit, and that constraints which will be set out in criteria-based policies have not been applied.

6.24. A comparison between the two estimates can be seen in Table 9 below.

Table 9. Comparison between LUC and WCC estimates of Worcestershire's crushed rock resources.

Document estimating resource	Area of unsterilized resource (ha)	Volume of unsterilized resource (mt)
LUC	508.98	427.58
WCC Analysis of mineral resources	1564.00	1,280.62

The difference in the figures for crushed rock is likely to be explained by the fact that international nature conservation, heritage designations and the Malvern Hills Conservators landholdings have not been screened out from the resources in the 2016 Analysis of Resources. Further work is currently underway to look at screening out international and national designations.

Sites, permitted reserves and applications pending

6.25. There were no sites with permitted reserves of crushed rock at 31st December 2016, and no planning applications for working crushed rock are pending decision. This means that Worcestershire has no permitted reserves, no productive capacity and no landbank for crushed rock.

Site allocations

6.26. The adopted County of Hereford and Worcester Minerals Local Plan (1997) allocated one preferred area for hard rock working in Worcestershire at Fish Hill near Broadway. This has been worked and the site has been undergoing restoration since 2010. There are therefore no remaining site allocations for crushed rock in Worcestershire in the adopted Minerals Local Plan.

6.27. Three calls for sites had been undertaken in the development of the new Minerals Local Plan by December 2016, with a fourth call for sites conducted in winter 2017/18, but no sites for crushed rock have been proposed for consideration as site allocations.

Pre-application discussions

6.28. During 2016, no pre-application discussions have been held with regard to potential crushed rock sites. This is a strong indication that there is limited interest in developing crushed rock workings in Worcestershire in the immediate future.

Constraints on resources

6.29. There has been very limited market interest in working crushed rock in Worcestershire[51] for many years and there are multiple factors relating to crushed rock resources in Worcestershire which may make it difficult for them to be worked. Of the land containing crushed rock resources in Worcestershire[52]:

- approximately 15% is adjacent to or within 2.5km of Bredon Hill Special Area of Conservation,
- 99.5% is within the Cotswolds AONB or Malvern Hills AONB[53] and
- The Malvern Hills Conservators control approximately 75% of the land containing crushed rock resources in the county and have a unique responsibility to protect land in their control from harm from quarrying activities.[54]

6.30. These issues have been discussed in detail with the Aggregate Working Parties in the West Midlands, South West, East Midlands and South Wales.[55]

Imports and exports of primary aggregates

6.31. The only source of information about the flows of imports and exports of crushed rock is the *Aggregate minerals survey for England and Wales*. This survey is undertaken about every 4 years and one aspect that it considers is the movement of material. It sets out information relating to the inter-regional flow of aggregates. The pattern of movements of crushed rock is illustrated in Figure 6.

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[51] Operations on two sites ceased due to the poor quality of the material. The county's last operational site was fully worked and ceased production in 2010.

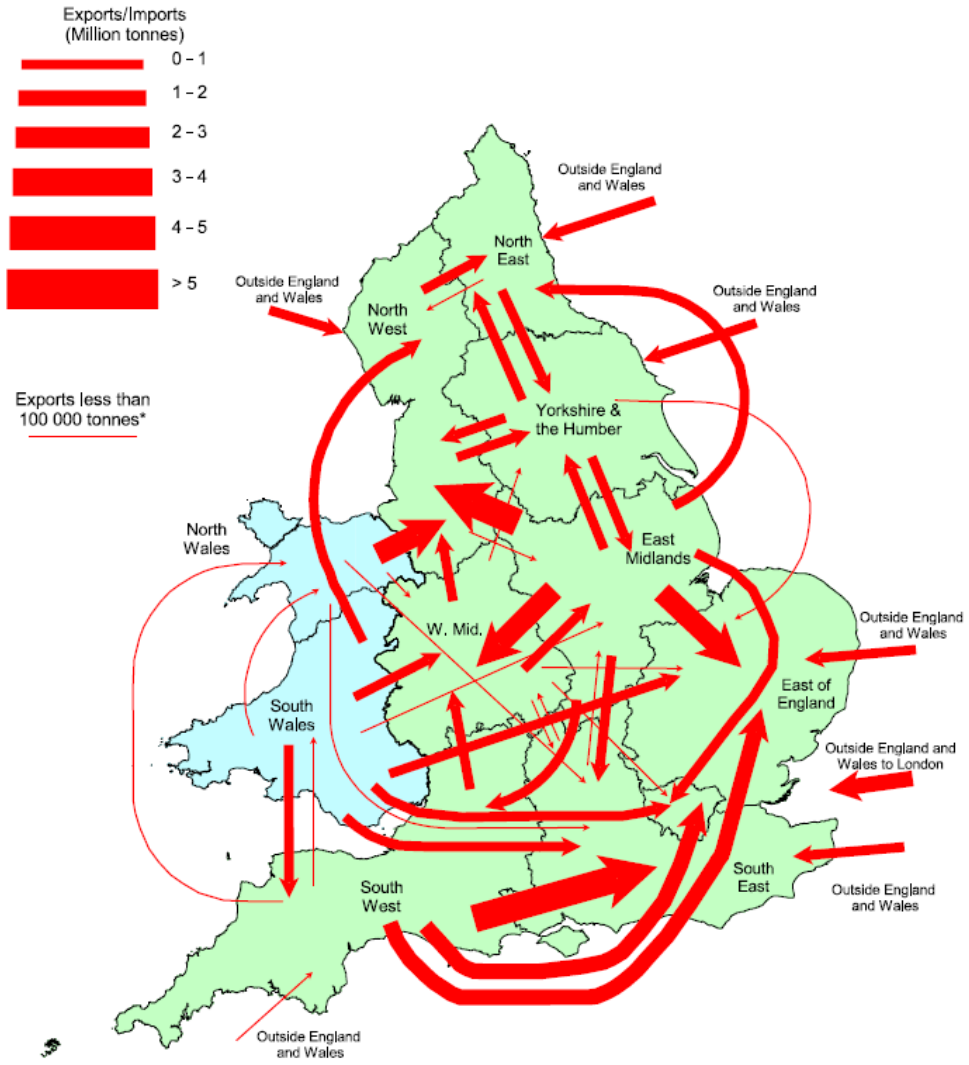
[52] Resource identified as *key* or *significant* in "Analysis of Mineral Resources in Worcestershire"

[53] Based on resources classified as Key or Significant in "Analysis of Mineral Resources in Worcestershire" http://www.worcestershire.gov.uk/info/20015/planning_policy_and_strategy/17/emerging_minerals_local_plan_background_documents/3

[54] In 1884 a private act of parliament set out a requirement that "every…new quarry shall be so placed as to cause as little injury and disfigurement to the hills as reasonably practicable". In 1924 a further private act of Parliament gave the Malvern Hills Conservators the authority to compulsorily purchase land and property rights to prevent further land use for quarrying. In 1953 the Minister of Housing and Local Government determined permissions relating to four of the remaining five quarries refusing permission on part or all of these sites in order to preserve the skyline and appearance of the Hills. It is unlikely that large scale mineral working will take place in the Malvern Hills in the future, although this is not specifically prevented by the Acts. See Background Paper: The Malvern Hills Acts for further details http://www.worcestershire.gov.uk/downloads/file/495/background_document_the_malvern_hills_acts

[55] See Background document "Strategic cross boundary issue: Crushed rock supply in Worcestershire. Summary of action undertaken under the duty to cooperate" July 2016

Figure 6. Crushed rock inter-regional flows, 2014



*For clarity, exports less than 25 000 tonnes are not shown.

Source: "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016)

6.32. The data which is available for Worcestershire in the *Aggregate minerals survey for England and Wales* for 2009 and 2014 is presented in Table 10 and Table 11. As there were no sales of crushed rock from Worcestershire recorded in either year, Worcestershire was an importer of crushed rock, with more than twice as much crushed rock being imported and consumed in the county in 2014 compared to 2009. However, discussion with the authors of the document[56] has revealed that the information does not represent a complete dataset from all mineral

[56] Email correspondence with Mr T Bide at the British Geological Survey (7th August 2017) revealed that for 2009 responses were only received for two quarries in Worcestershire, and in 2014 for only 1 quarry.

operators. It is therefore considered that significant caution must be applied in relying on this data.

Table 10. Imports of primary crushed rock in to Worcestershire

	2009	2014
Tonnes of crushed rock	192,000	540,000

Source: "*Collation of the results of the 2009 aggregate minerals survey for England and Wales*" Communities and Local Government (October 2011) table 10 and "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016) table 10

Table 11. Balance of crushed rock exports and imports in Worcestershire

	Exports	Imports	Balance
2009	0	192,000	Net importer (192,000)
2014	0	540,000	Net importer (540,000)

Source: Based on data in "*Collation of the results of the 2009 aggregate minerals survey for England and Wales*" Communities and Local Government (October 2011) and "Collation of the results of the 2014 aggregate minerals survey for England and Wales" Communities and Local Government (March 2016)

6.33. Worcestershire does not have any rail depot for the import or export of minerals. Water transportation takes place on the River Severn, but this is limited to moving "as-dug" material from one site in Worcestershire to processing plant at another. The wharves at these sites therefore do not currently enable imports or exports of minerals. It is therefore concluded that all imports and exports currently take place by road transport.

Conclusion: Balancing supply and demand

6.34. Whilst a 10 year average of crushed rock sales has been calculated as 0.026 million tonnes and there is no evidence that demand for crushed rock is likely to decrease, there has been no production of crushed rock in Worcestershire since 2010.

6.35. The delivery constraints outlined above, the lack of interest in Worcestershire's resources shown by the minerals industry over many years, and the fact that no sites for crushed rock have been proposed in response to four "calls for sites" indicate that it is unlikely that Worcestershire will be able to provide crushed rock for the foreseeable future. These are all strong indicators that the 10 year average is not suitable. Discussions with the West Midlands, East Midlands, South West and South Wales Aggregate Working Parties concluded that Worcestershire's production guideline for crushed rock should be reduced to 0 tonnes. However, recognising the National Planning Policy Framework's requirement to maintain at least a 10 year landbank of permitted reserves of crushed rock, the emerging Minerals Local Plan will provide a policy framework which could enable crushed rock development to take place.

6.36. There is no data available to indicate how much of the demand for crushed rock has been met by substitution with either secondary or recycled materials or by sand and gravel. It is likely that the majority of demand has been met by increased imports of crushed rock from outside the county. This has been discussed in detail with the West Midlands, East Midlands, South West and South Wales Aggregate Working Parties. The Mineral Planning Authorities and Aggregate Working Parties have indicated that supplying

Worcestershire's demand for crushed rock can continue to be accommodated.

6.37. This LAA therefore concludes that the production guideline for crushed rock in Worcestershire should be 0 tonnes per annum.

7. Conclusion

Substitute, secondary and recycled aggregates

7.1. Whilst national policy requires Local Planning Authorities to take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials before considering extraction of primary materials, the lack of data will make this difficult to monitor at the local level, and the evidence above from the Minerals Products Association indicates that this Local Aggregates Assessment should not rely on any significant alterations to the proportion of supply.

7.2. On this basis, this LAA assumes that the contribution of substitute, secondary and recycled materials is already accounted for prior to considering the sales figures for primary aggregates.

Marine aggregates

7.3. As an inland county, the Worcestershire Minerals Local Plan cannot make provision for the production of marine sand and gravel.

Primary aggregates: sand and gravel

7.4. There is not sufficient evidence to suggest that the production guideline for primary sand and gravel should vary from the 10 year average. The production guideline for sand and gravel identified by this Local Aggregates Assessment is therefore 0.607 million tonnes.

7.5. Based on this production guideline and the stock of permitted reserves of 4.244-4.294 million tonnes, Worcestershire had a landbank for primary sand and gravel of 6.99-7.07 years at 31st December 2016, compared to the landbank requirement of 7 years.

7.6. This indicates that there is currently a sufficient stock of permitted reserves in the county. However, with only one further planning application pending and no other remaining site allocations in the adopted Minerals Local Plan, there is a significant risk that this landbank could diminish significantly before other planning permissions are secured.

7.7. Work is well underway on a new Minerals Local Plan and a number of sites have been submitted for inclusion in that plan. Some of those sites may be brought forward in the near future. However, the minerals industry has indicated that there are likely to be significant constraints on finding sites of sufficient size and quality in the county in future.

Primary aggregates: crushed rock

7.8. There has been no production of crushed rock in Worcestershire since 2010. Worcestershire has no permitted reserves, no productive capacity and no landbank for crushed rock.

7.9. This has been discussed in detail with the West Midlands, East Midlands, South West and South Wales Aggregate Working Parties. The Mineral

Planning Authorities and Aggregate Working Parties have indicated that supplying Worcestershire's demand for crushed rock can be accommodated.

7.10. This LAA therefore concludes that the production guideline for crushed rock in Worcestershire should be 0 tonnes per annum.

Transporting minerals

7.11. Worcestershire does not have any rail depot for the import or export of minerals. Water transportation takes place on the River Severn, but this is limited to moving "as-dug" material from one site in Worcestershire to processing plant at another. The wharves at these sites therefore do not currently enable imports or exports of minerals. It is therefore concluded that all imports and exports currently take place by road transport.

7.12. Transportation from any future minerals sites will be considered through the planning process and subject to the policies of the Minerals Local Plan, which will include consideration of the need for transport and air quality assessments.

Appendix 1: Consultation with Aggregate Working Parties

A draft of this Local Aggregates Assessment was sent to the West Midlands, for consultation in October 2017 and the East Midlands, South West and South Wales Aggregate Working Parties in February 2018. The following comments were received from the AWPs and their members:

West Midlands Aggregate Working Party

Staffordshire County Council

- **SCC comment:** LAA Dashboard: I will copy this more comprehensive format of table in the Staffs LAA

  WCC response: Noted. No action required.

- **SCC comment:** Para 5.32: I know that Worcestershire CC have carried out a great amount of work assessing remaining resources. It might be useful in context to consider the total unsterilised resource as assessed in the LUC work undertaken in 2010 for the sub regional apportionment and to update that assessment with any subsequent assessment of the availability of resources. What would be the County's response to the comments from the MPA?

  WCC response: A telephone discussion with SCC clarified the report referred to was the "*Sub-Regional Apportionment of Aggregates Provision in the West Midlands Region 2005 – 2020 Consultation paper 17-02-2010*" which was prepared for the West Midlands Regional Assembly by Land Use Consultants in February 2010. This used the British Geological Survey (BGS) mineral resource dataset (1:50,000) as the starting point for the distribution of resources in the region in GIS, and then applied the following factors which were considered to sterilise the resource:
    - The road network – based on the Primary Road Network with a 5m buffer of the line features in GIS to approximate the footprint on the ground;
    - Railways – based on railway data supplied by WMRA with a 5m buffer of the line features in GIS to approximate the footprint on the ground;
    - Urban areas – based on the 2001 Census Urban Areas dataset; and
    - Worked-out sites – based on information provided by mineral planning authorities (no GIS data on historical sites in Worcestershire was available at that time).

  All international nature conservation and heritage designations were also removed to reflect the level of protection that international designations are afforded by the Planning system, and the Malvern Hills Conservators

landholdings were also removed due to the restrictions on quarrying imposed by the Malvern Hills Acts[57].

A mean working thickness for each deposit type in each sub-region was derived and these were applied to the remaining areas of each mineral deposit to convert the area (ha) to a volume (mt) using bulk density figures of 1675kg/m^3 for sand and gravel, and 2600kg/m^3 for hard rock.

This resulted in the following estimates of unsterilised resources in Worcestershire:

Mineral type	Area of unsterilized resource (ha)	Volume of unsterilized resource (mt)	% of regional total
Sand and gravel	25,036.34	3,222.57	9.97%
Crushed rock	508.98	427.58	0.84%

Worcestershire County Council has since undertaken its own analysis of the mineral resources in the county.[58] This is also based on the BGS 1:50,000 GIS data, applying minimum size thresholds for the deposits considered (>10ha in area and >200m wide), and analysing BGS memoirs and planning histories to estimate the likely depth of each deposit. Conversion factors of 1.65t/m^3 for sand and gravel and 2.45t/m^3 for crushed rock were applied following consultation responses, these are considered to be broadly comparable to the bulk density figures used in the LUC report. Some consideration was given to areas sterilised by surface development, and the calculated volume was halved in estimating the available resource volume in order to recognise that some areas are overlain by dispersed development, that information about depth is limited and the quality and depth can vary across a deposit, and that constraints which will be set out in criteria-based policies have not been applied.

This analysis led to the following estimates of resources in Worcestershire:

- 248.66 million tonnes of terrace and glacial sand and gravel,
- 3,398.00 million tonnes of solid sand (total sand and gravel therefore 3,646.66 tonnes), and
- 1,280.62 million tonnes of crushed rock.

The figures for sand and gravel appear to be broadly comparable to those in the LUC report, but the difference in the figures for crushed rock is likely to be explained by the fact that international nature conservation, heritage designations and the Malvern Hills Conservators landholdings have not been screened out from the resources in the 2016 Analysis of Resources.

[57] Information on the Malvern Hills Acts is available in the Worcestershire Minerals Local Plan Background Document "The Malvern Hills Acts" (October 2012), available at www.worcestershire.gov.uk/mineralsbackground.

[58] Worcestershire County Council (August 2016) *Worcestershire Minerals Local Plan Background Document: Analysis of Mineral Resources in Worcestershire*, available at www.worcestershire.gov.uk/mineralsbackground.

Further work is currently underway to look at screening out international and national designations.

Changes have been made to the sand and gravel and crushed rock supply sections to highlight the key points of this analysis.
In addition, paragraph 5.39 (this was paragraph 5.32 in the consultation draft) has been updated to respond to the industry's comment regarding the availability of large sites.

- **SCC comment:** Paras 5.35 and 5.36: The 2014 AM Survey figures indicate that Worcestershire relied significantly on sand and gravel imports in terms of meeting consumption within the county (50 - 60% of supply was reported from quarries in Staffordshire) but I note the comment on the reliability of the AM2014 survey for Worcestershire data. Presumably, the figure for total sales in 2014 as stated in table 2 is more reliable than the figure in table 4.

  WCC response: Noted, paragraph 5.42 (this was paragraph 5.35 in the consultation draft) has been updated to clarify this.

Mineral Products Association

- **MPA comment:** Paras 5.19 and 6.17: Including infrastructure associated with housing the figure is 400 tonnes /house. See *The need for indigenous aggregate production in England* by the BGS. page 7.
  WCC response: Changes have been made to paras 5.19 and 6.17 to reflect the updated information.

- **MPA comment:** Para 6.22 [6.29]: These issues do not necessarily preclude working of mineral and that should be made clearer here...refer to NPPF para 116.
  WCC response: As set out in paragraph 6.29, these issues are just one part of the overall picture that has been discussed in detail with the Aggregate Working Parties in the West Midlands, South West, East Midlands and South Wales and indicates that Worcestershire should not pursue a production guideline which it is unlikely to be able to meet for the foreseeable future. However, changes have been made to paragraph 6.29 to clarify that these are not absolute constraints.

- **MPA comment:** Paras 6.24 [6.30] and 7.9 [7.10]: …while recognising the National Planning Policy to maintain at least a 10 years reserves of crushed rock....see para 2.1.
  WCC response: Changes have been made to paragraphs 6.30 and 7.10 to recognise this point.

Cemex

- **Cemex comment:** Paragraph 5.11 – I note that you've accounted for both Ryall and Clifton being out of production during 2016. This trend will be continued into the 2017 as neither site had a full year's production, this won't be the case until 2018. As a result the 3 year sales average in particular will be artificially depressed for a number of years. As a result

you're quite correct to treat the three year sales average with some scepticism
- **MPA comment:** noted

- **Cemex comment:** Paragraph 5.15 – I don't disagree with the conclusion but it appears that its been reached solely on the basis of the Northamptonshire decision referenced in the previous paragraph. I presume that in reality this conclusion was reached on the basis of considering the factors discussed within paragraphs 5.16 – 5.22? If this is the case I'd suggest that para. 5.15 would be better translocated to after 5.22.
- **MPA comment:** Each sub-section relating to supply and demand contains a conclusion as to whether that individual issue warrants a deviation from the 10 year average. The outcome of these issues is then discussed in the conclusion (para 5.45-5.48) to assess whether the overall balance of demand and supply means that a deviation from the 10 year average would be appropriate. Changes have been made to para 5.45 to ensure it is clear that this paragraph is where the overall balance is established.

East Midlands Aggregate Working Party

Northamptonshire County Council

- **NCC comment:** the web link referred to on p22 of the LAA (footnote 39) has now changed to: http://www3.northamptonshire.gov.uk/councilservices/environment-and-planning/planning/planning-policy/minerals-and-waste-planning-policy/documents/PDF%20Documents/ReportToNorthamptonshireCountyCouncilV3.pdf
- **WCC response:** Noted, this link has been updated.

Lincolnshire County Council

- **LCC comment:** We have reviewed the report, but given the very limited implications for Lincolnshire, have no comments to make.
- **WCC response:** Noted.

South West Aggregate Working Party

Gloucestershire County Council

- **GCC comment:** Whilst we have no specific comments on the draft LAA, we note that that the emerging aggregate trends have potential implications for Gloucestershire and that GCC would welcome exploring cooperation on future aggregate monitoring matters.
- **WCC response:** Noted. We appreciate the cooperation that has happened with Gloucestershire County Council to date, and welcome ongoing cooperation on these matters.

South Gloucestershire Council

- **SGC comment:** No comments from us.
- **WCC response:** Noted.

South Wales Aggregate Working Party

No comments received.