

Nottinghamshire and Nottingham Local Aggregates Assessment

Containing 2019 sales data

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Summary

The Nottinghamshire and Nottingham Local Aggregates Assessment (LAA) is a document that is to be produced under the requirements set out in the National Planning Policy Framework (NPPF) and covers the geographical area of Nottinghamshire, including the Nottingham City unitary authority area. It monitors annual sales data for aggregate minerals between 2010 and 2019 as well as identifying other relevant local information to enable the Mineral Planning Authorities to plan for a steady and adequate supply of minerals.

Aggregate minerals in Nottinghamshire are made up of sand and gravel, Sherwood Sandstone and crushed rock and are used in the construction industry. Their main uses include concrete, mortar, asphalt, railway ballast and bulk fill.

The LAA sets out:

- Summaries of past aggregate sales, number of active quarries and the distribution of the extracted mineral;-
- The latest 10 and 3 year average sales data and a comparison to the previous average sales data; and,-
- The key issues that could affect the future demand for aggregates over the next plan period.

Key Findings

Nottinghamshire is an important producer of sand and gravel and Sherwood Sandstone and has a large export market, particularly to South Yorkshire and the wider East Midlands. Crushed rock production is minimal with most imported from Derbyshire and Leicestershire.

Whilst aggregate mineral resources are present in the Nottingham City area, the opportunities to work these minerals are limited due to the built-up nature of the area. As a result, the majority of aggregates consumed in the City are supplied from either Nottinghamshire or further afield.

The Nottingham City Land and Planning Policies document contains policies against which any proposal for minerals development within the City boundary would be assessed, including a Minerals Safeguarding Policy, however it does not include demand forecasts for aggregate minerals.

Sales of aggregate minerals fell significantly as a result of the recession in 2007 and since this time have remained subdued. Sales of sand and gravel in 2009 and 2016 were recorded at 1.27mt, levels not seen in Nottinghamshire since records began in 1973.

The 2019 sales data shows a decrease in sand and gravel sales and Sherwood Sandstone sales compared to the 2018 data whilst Crushed rock (limestone) output remains at zero.

As shown in Table One, the latest 10-year average sales figures show that sand and gravel sales have stabilised recently, with the average equalling the 2019 sales figure. This though remains below previous 10-year averages which contained pre-recession sales figures, indicating that sales have remained subdued following the recession. The 3-year average for sand and gravel shows a similar pattern though is slightly below the current 10-year average. The County still has a sufficient landbank, with this standing at 12.85 years and so above the NPPF 7-year requirement.

Sherwood Sandstone sales have remained broadly stable over the years, with a slight increase in sales in 2018 and 2019 which has risen the 3-year average slightly above the 10-year average as shown in Table One. The County still retains a sufficient landbank for Sherwood Sandstone at 21.9 years.

Whilst the County does have a permitted site to extract crushed rock (limestone), this site has been inactive since 2007 and so sales have remained at zero.

Table 1: Sales and landbank figures as of December 2019

	2019 sales (million tonnes)	10-year sales average 2010-2019 (million tonnes)	3-year sales average 2017-2019 (million tonnes)	Permitted reserves (million tonnes)	Landbank (years)
Sand and gravel	1.47	1.47	1.44	18.94	12.85
Sherwood Sandstone	0.4	0.37	0.41	8.1	21.9
Crushed rock (limestone)	0.00	0.00	0.00	3.34	N/A

Introduction

- 1.1 The requirement to prepare a Local Aggregates Assessment (LAA) was introduced in the National Planning Policy Framework (NPPF) in March 2012 and is a continued requirement within the 2019 NPPF. The LAA should include the latest 10 years average sales data taking into account any important local considerations, sub national and national guidelines on aggregate provision. The data contained in the LAA will then enable the Minerals Planning Authorities (MPAs) to make provision for a steady and adequate supply of aggregate minerals in their area over the life of the Minerals Local Plan.
- 1.2 The Planning Practice Guidance also sets out an additional requirement to identify the 3-year average sales figure in particular to identify the general trend of demand as part of the consideration of whether it might be appropriate to increase supply.
- 1.3 This LAA sets out the aggregate minerals found in the geographical area of Nottinghamshire including Nottingham City, the current situation in terms of annual sales, the number of active quarries and the amount of aggregate that will need to be provided over the plan period.
- 1.4 It is important to note that whilst aggregate mineral resources are present in the Nottingham City boundary, the opportunities to work these minerals are limited due to the built-up nature of the area. As a result, the majority of aggregates consumed in the City are supplied from either Nottinghamshire or further afield.
- 1.5 The Nottingham City Land and Planning Policies document contains policies against which any proposal for minerals development within the city boundary would be assessed against, including a Minerals Safeguarding Policy, however it does not include demand forecasts for aggregate minerals.
- 1.6 The information used in this LAA is based upon information retrieved from the 2019 Aggregate Monitoring (AM) survey returns relating to the period 1st January to 31st December 2019.
- 1.7 This year the information was collated through a new national survey instead of by the East Midlands Aggregate Working Party. The Aggregates Working Party is made up of MPAs from across the region and industry representatives. Its role is to provide technical advice about the supply and demand for aggregates and it usually undertakes annual monitoring of aggregate production and levels of permitted reserves across the East Midlands. This information is then supplied to MPAs and to the National Aggregate Co-ordinating Group to inform national aggregate provision.
- 1.8 The LAA is required to be updated on an annual basis and will enable the County and City Councils to monitor ongoing patterns and trends in aggregate sales and ensure that adequate reserves are maintained over the plan period.

Aggregates in Nottinghamshire and Nottingham City

- 2.1 Aggregates account for around 90% of minerals used in construction and are essential in maintaining the physical framework of buildings and infrastructure on which our society depends. Aggregates are usually defined as hard granular materials and include sand and gravel, Sherwood Sandstone and limestone. Their main uses include concrete, mortar, Roadstone, asphalt, railway ballast, drainage courses and bulk fill. Alternative aggregates are also used within Nottinghamshire, which include secondary and recycled materials.

Primary aggregates

- 2.2 Plan 1 illustrates the following primary aggregates that are found in the geographical area of Nottinghamshire and Nottingham.

Sand and gravel

- 2.3 Important alluvial (river) sand and gravel deposits are found in the Trent and the Idle Valleys which have made Nottinghamshire an important producer of sand and gravel in the East Midlands. Limited extraction also occurs in glaciofluvial sand and gravel deposits near East Leake, south of Nottingham. Sand and gravel is mainly used in ready mixed concrete production, although Nottinghamshire's reserves are particularly valuable because they meet high strength concrete specifications as the gravel is made up of quartzite.

Sherwood Sandstone

- 2.4 Although defined as sandstone, this rock formation rapidly breaks down to sand when extracted. The sandstone occurs as a broad north-south belt stretching from the border with South Yorkshire, southwards to Nottingham. The mineral is mainly used to produce asphalt and mortar sand. There is relatively little overlap with the uses for which alluvial and glacial sand and gravels are suitable. Sherwood Sandstone is also used for non-aggregate industrial and other specialist end-uses.

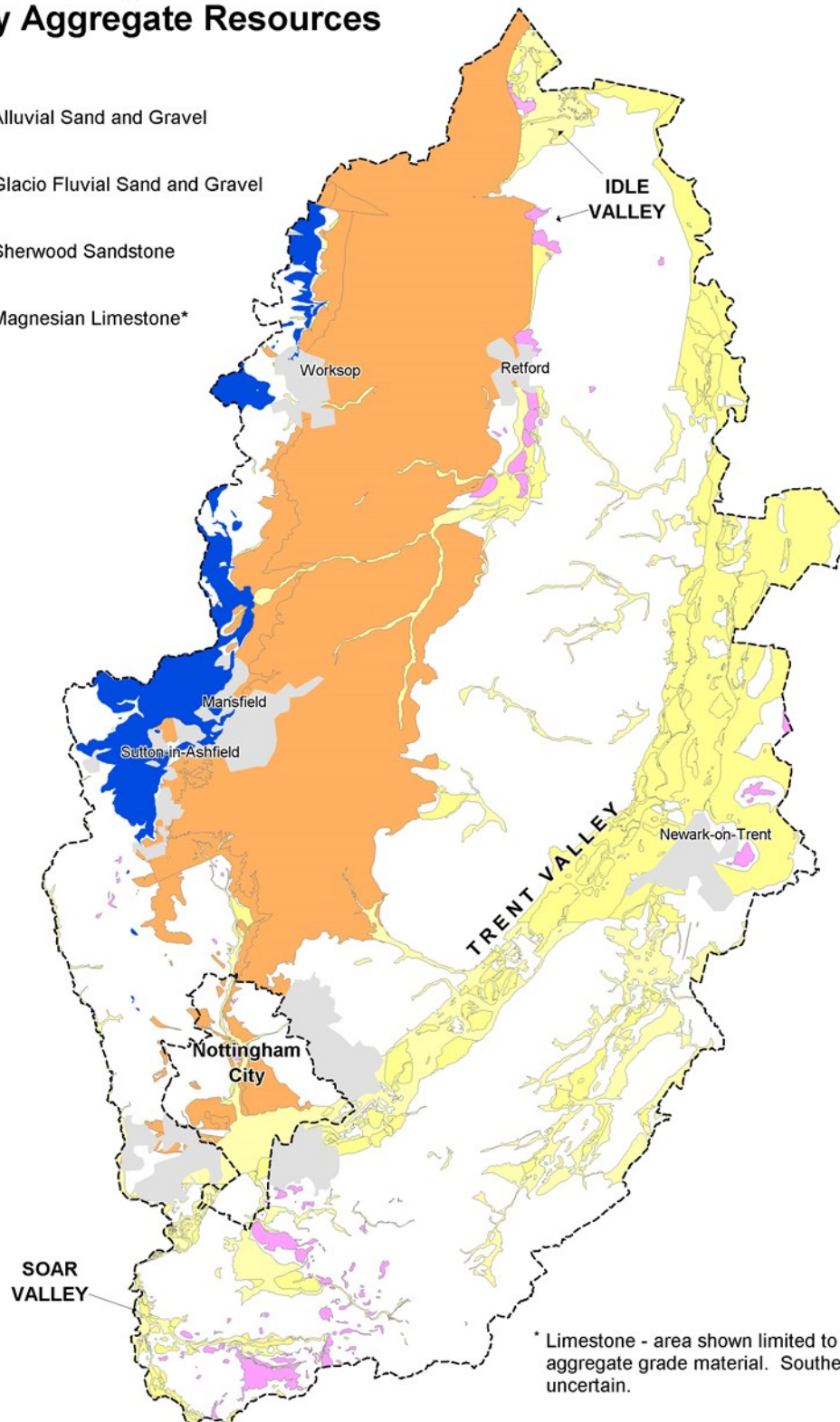
Magnesian Limestone

- 2.5 This resource occurs as a relatively narrow belt to the west of the Sherwood Sandstone. This outcrop comprises the southernmost limits of the UK's second largest limestone resource that extends from the Durham coast through Yorkshire into Derbyshire and Nottinghamshire. Limestone suitable for use as an aggregate is only found in the Mansfield area and to the north where the mineral is used mainly as a road sub-base material although some mineral is of industrial grade quality. Production is relatively small scale and the lowest in the East Midlands. Around Linby the limestone is suitable for building and ornamental purposes, although aggregates can be produced as a by-product of utilising reject building stone.

Plan 1 - Nottinghamshire - Primary Aggregate Resources

Key

- Alluvial Sand and Gravel
- Glacio Fluvial Sand and Gravel
- Sherwood Sandstone
- Magnesian Limestone*



* Limestone - area shown limited to aggregate grade material. Southern limit uncertain.

* Alluvial Sand and Gravel - minor tributaries and glaciofluvial - economic potential limited.

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British Geological Survey, 2013. Digital Geological Map of Great Britain 1:625 000 scale (DiGMapGB-625)
Superficial Deposits data [CD-Rom] Version 1.10. Keyworth, Nottingham: British Geological Survey.
Release date 30-04-2003

Alternative aggregates

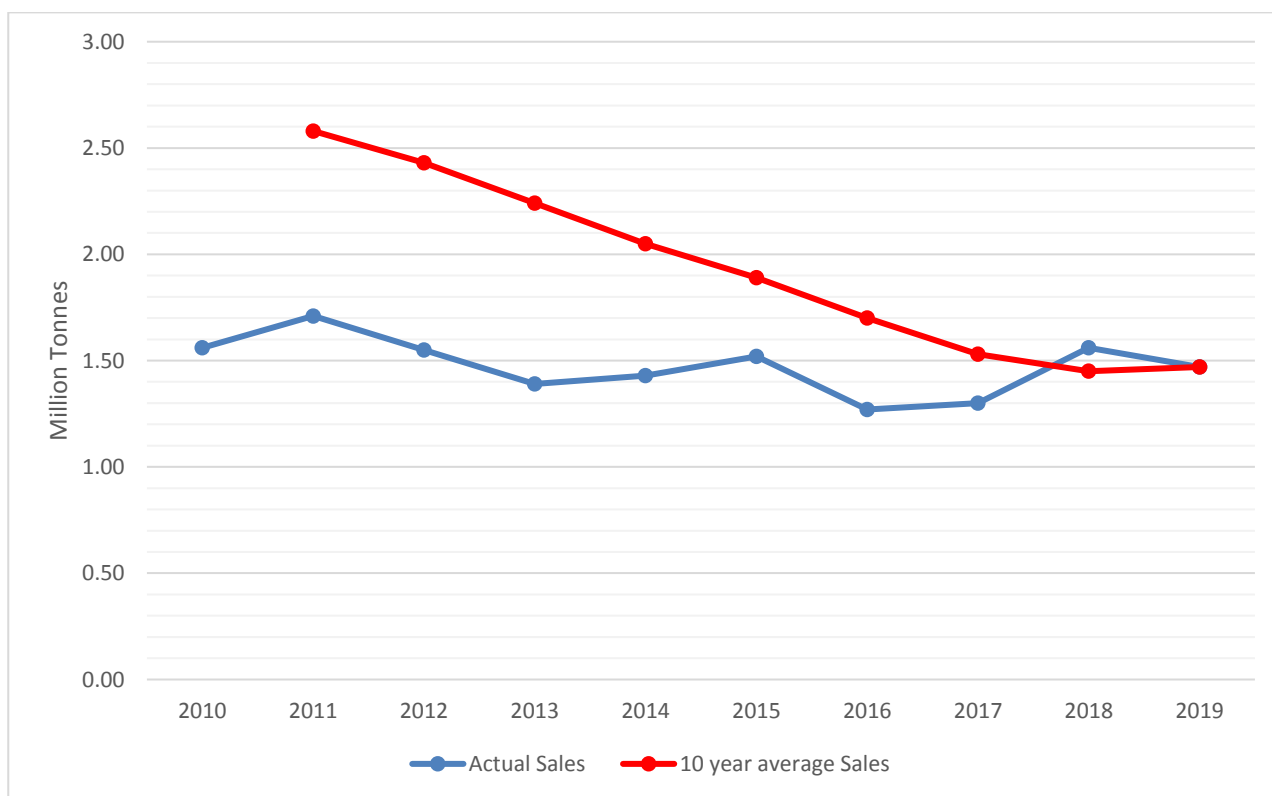
- 2.6 Alternative aggregates comprise secondary and recycled materials, although these terms are often used interchangeably. Recycled aggregates are materials that have been used previously and include some types of construction and demolition waste, asphalt road planings and used railway ballast. Secondary aggregates are by-products of other processes that have not been previously used as aggregates. They include colliery spoil, china clay waste, slate waste, power station ashes, blast furnace and steel slag, incinerator ashes and foundry sands.
- 2.7 Alternative aggregates are currently most widely used in lower grade applications such as bulk fill. However, the range of uses is widening due to advances in technology and the increasing economic incentive to use them instead of primary aggregates.
- 2.8 In Nottinghamshire, sources of alternative aggregates include construction and demolition waste, power station ash, river dredgings, road planings and rail ballast.

Local production

Sand and gravel

- 3.1 As shown in Figure 1 sales for sand and gravel have remained relatively stable over the 10-year period, fluctuating between 1.30 million tonnes and 1.71 million tonnes with the 2019 sales at 1.47 million tonnes. The main factor that has changed within this timeframe is production at Finningley quarry moving between Nottinghamshire and Doncaster resulting in the rise and falls in sales. The reserves at Finningley have now been exhausted, with the mineral extracted in 2019 from within Nottinghamshire but processed at the plant within Doncaster.
- 3.2 Whilst sales have increased since the recession in 2009, they have remained subdued in comparison to pre-recession sales figures, with the number of permitted quarries coming online to replace worked out quarries remaining low.

Figure 1: Sales of sand and gravel 2010-2019 against the 10-year average sales figure.



Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sales (Million tonnes)	1.56	1.71	1.55	1.39	1.43	1.52	1.27	1.30	1.56	1.47

Resources and landbank

- 3.3 The landbank is calculated by dividing existing permitted reserves by the level of production based on the average sales over the last 10 years. This is in line with guidance set out in the National Planning Practice Guidance.
- 3.4 Permitted reserves currently total 18.94 million tonnes, with average sales over the last 10 years standing at 1.47 million tonnes per annum. Therefore, as of December 2019 the landbank stood at 12.85 years of production. This is above the minimum 7-year landbank requirement set out in the NPPF.
- 3.5 The sand and gravel landbank had been increasing in recent years, caused by permitted reserves increasing due to a significant extension being granted at Langford Lowfield quarry and the 10 year average (which is used to calculate the landbank) falling since 2011 as the higher pre-recession sales data is no longer included in the 10 year average. In 2019, the landbank fell slightly to 18.94 years from 20.1 years in 2018. This is due to the 10-year average beginning to plateau at 1.47 million tonnes and the fact that no new quarries are currently being developed to replace previously worked out quarries in the county.
- 3.6 There are eleven permitted sand and gravel quarries in Nottinghamshire, although at present only nine are in full production, with Gorton only working existing stockpiles (see Table 2).

Table 2: Permitted sand and gravel quarries in Nottinghamshire

Site	Operator	Status	Permitted reserves (mt)
Langford Lowfields	Tarmac	Active	4.17
Gorton	Tarmac	Inactive	3.72
Besthorpe	Tarmac	Active	0.89
Sturton Le Steeple	Tarmac	Yet to be worked	7.1
East Leake	CEMEX	Active	1.60
Cromwell	CEMEX	Active	0.76
Misson West	Hanson	Active	0
Misson Newington	Hanson	Active	0
Scrooby	Rotherham Sand & Gravel	Active	0.33
Finningley	Tarmac	Active	0
Misson Bawtry Road	Rowley	Active	0.37
TOTAL			18.94

Geographical spread of sand and gravel quarries

- 3.7 Historically a geographical spread of sand and gravel quarries has developed across Nottinghamshire, resulting in three geographic areas. This has occurred due to the location of sand and gravel reserves along the Trent and Idle Valley but also due to where key markets are within Nottinghamshire and neighbouring authorities. As of December 2019, the location of quarries with planning permission in Nottinghamshire is set out in table 3.

Table 3: Location of existing permitted quarries in Nottinghamshire

Geographic Area	Total tonnage in the area (million tonnes)			Percentage of total reserves		
	2017	2018	2019	2017	2018	2019
Idle Valley	8.77*	8.26*	7.8*	49%	41%	41%
Newark	7.12	10.03	9.54	39.8%	49%	50%
Nottingham	2	1.81	1.60	11.2%	9%	9%

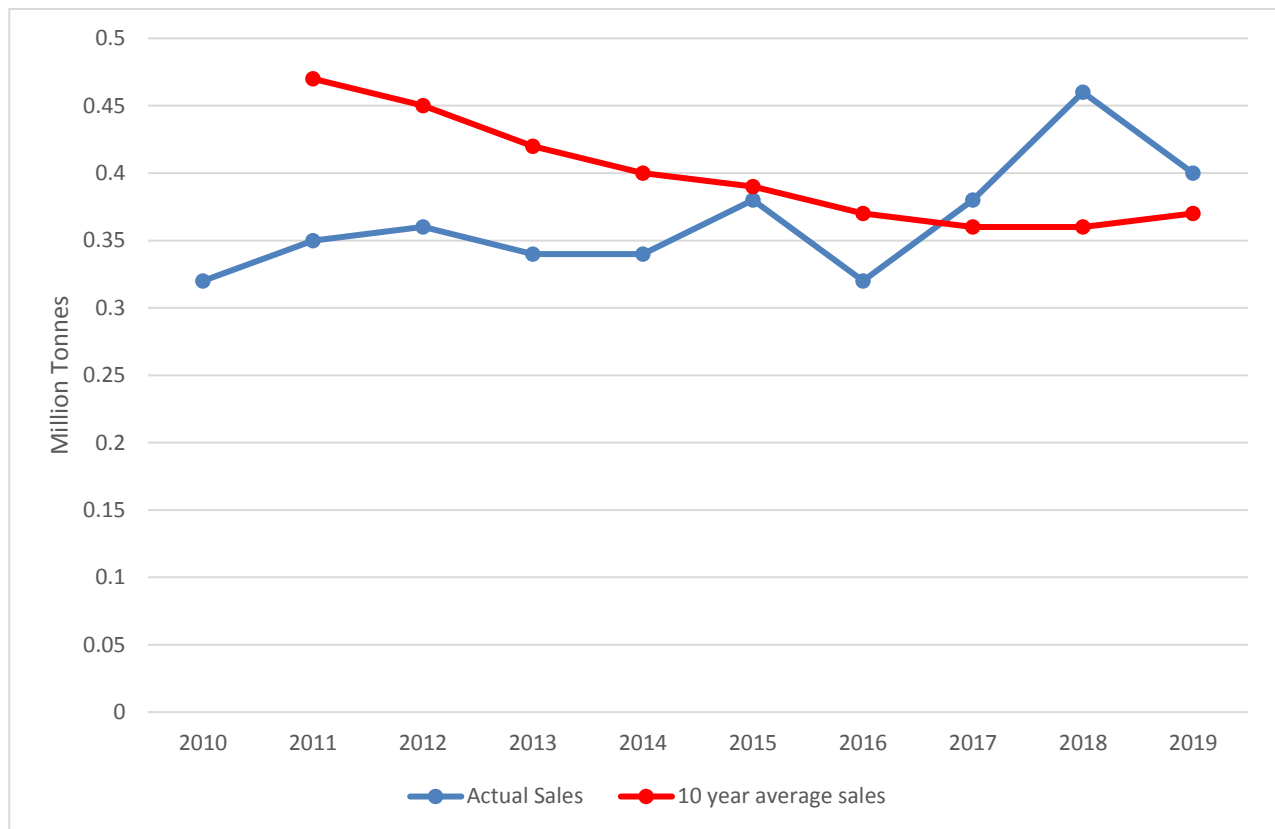
*Of the reserves in the Idle Valley, 7.1 million tonnes is contained in Sturton Le Steeple quarry, which is currently inactive.

- 3.8 Whilst this shows the current geographic spread of permitted quarries, it is important to note that over time, as reserves are worked and additional reserves are granted planning permission, this spread will change.

Sherwood Sandstone

- 3.9 Historically Sherwood Sandstone sales have been much lower than sand and gravel sales as it is generally used in different, more specialist markets. Between 2010 and 2017, sales have remained relatively stable, between 0.32 and 0.38 million tonnes a year. Sales increased in 2018 to 0.46 million tonnes, with this falling slightly to 0.4 million tonnes in 2019. (see Figure 2 below)

Figure 2: Sales of Sherwood Sandstone, 2010-2019 against 10-year average sales figure. (Figures in million tonnes)



Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sales (million tonnes)	0.32	0.35	0.36	0.34	0.34	0.38	0.32	0.38	0.46	0.4

Resources and landbank

- 3.10 There are four permitted Sherwood Sandstone quarries in Nottinghamshire, all of which are currently active (see Table 4 below). Permitted reserves currently total 8.10 million tonnes, with average sales over the last 10 years standing at 0.37 million tonnes. Therefore, as of December 2019 the landbank stood at 21.9 years. This is above the minimum 7-year requirement.

Table 4: Permitted Sherwood Sandstone quarries in Nottinghamshire

Site	Operator	Status	Permitted Reserves (mt)
Burntstump	Tarmac	Active	1.89
Bestwood 2	Tarmac	Active	2.27
Two Oaks Farm	Mansfield Sand Company	Active	3.43*
Scrooby Top	Rotherham Sand & Gravel	Active	0.51*
TOTAL			8.10

*Estimated figure

Imports and exports of sand and gravel (including Sherwood Sandstone)

- 3.11 Imports and exports of aggregates have only been recorded as a one-year snapshot generally every four years through the National Survey of Aggregate Movements undertaken by the British Geological Survey. The surveys do not include a breakdown for Sherwood Sandstone, hence all sand and gravel import and export figures include Sherwood Sandstone. Import data is much more limited and is calculated using the median percentage range as supplied in the National Survey of Aggregates Movement. As such the data is an approximate figure.
- 3.12 The last Survey was undertaken in 2014 and previous to that in 2009. A full survey was intended to be undertaken in 2018 however this has not taken place.
- 3.13 As a result of the delay to the national survey, data collected by the East Midlands Aggregate Working Party has been used to identify the destination of exports from Nottinghamshire. Import data is more limited. See Table 5 & 6.
- 3.14 Caution should be used when comparing the 2014 and 2018 sales data as the response rates between the two surveys may vary. The data does however provide a broad comparison of aggregate flows.

Table 5 Exports from Nottinghamshire

Destination	2009 survey (‘000 tonnes)	2014 survey (‘000 tonnes)	2018 survey (‘000 tonnes)
Bedfordshire	0.02	0	0
East of England unknown	5	0	0
Cambridge and Peterborough	0.07	0	1
Essex	0.05	0	0
Derbyshire and Peak District	104	87	64
Leicestershire and Rutland	98	141	166
Lincolnshire	67	40	57
Northamptonshire	0	0.14	406
Nottinghamshire	760	499	126
East Midlands unknown	138	76	194
Durham	0	0.03	0
Cheshire	0.13	1	0.6
Greater Manchester, Merseyside, Halton & Warrington	0	0.02	0.2
Lancashire	0.04	0.02	0.1
Berkshire	0	0.11	0.1
Avon	0	0	0.2
Scotland	0.03	0	0
Shropshire	0	0.17	5
Buckinghamshire	5	0	0
Kent	0.2	0	0
Gloucester	0	0.06	0
Staffordshire	4	0.23	26
Warwickshire	3	25	17
Remainder of West Midlands	3	26	16
West Midlands unknown	0	0	14
Humber (East Riding, North Lincs and NE Lincs)	106	141	64
North Yorkshire, Yorkshire Dales and North York Moors	1	16	27
South Yorkshire	145	412	386
West Yorkshire	143	92	67
North East Wales		0	0.5
Unknown	-	210	375
TOTAL			2,010

Table 6: Imports into Nottinghamshire

Origin	2014 survey (‘000 tonnes)	2018 survey (‘000 tonnes)
Cambridgeshire	5	N/A
Derbyshire and Peak District	5	N/A
Leicestershire and Rutland	52	N/A
Lincolnshire	299*	246*
Staffordshire	155	N/A
Doncaster	5	N/A
TOTAL	521	N/A
*based on data from Lincolnshire County Council		

- 3.15 The amount of sand and gravel and Sherwood Sandstone known to be exported from Nottinghamshire is 1.31 million tonnes, or 66% of the total amount extracted (2.01 million tonnes recorded). However, an additional 375,000 tonnes are classified as having an unknown destination. Based on past export sales data it is likely that this sand and gravel served markets within Nottinghamshire.
- 3.16 The results of the 2018 full survey show that the largest amount of sand and gravel (approx. 400,000 tonnes) was exported to Northamptonshire. Northamptonshire has not traditionally been a major market for sand and gravel from Nottinghamshire. This will be monitored in future years to understand if this was a ‘one off’ spike in supply for a specific need or if this is likely to continue in the future. Exports to south Yorkshire stood at 386,000 tonnes which is to be expected as historically sand and gravel from Nottinghamshire has supplied this market. Other export markets include other neighbouring authorities in the East Midlands¹.
- 3.17 Imports of sand and gravel from elsewhere in the East Midlands (based on 2014 data) were lower compared to the amount extracted from the County’s own quarries. However, the amount imported still totalled approximately 521,000 tonnes, with the majority supplied by Lincolnshire.
- 3.18 Given the relatively low value and bulky nature of aggregates, transport forms a major part of its cost. As a result, the distance minerals can be economically transported by road is relatively limited. National figures identify the average distance travelled in 2017 was 26.7 miles². No data is available at the local level.

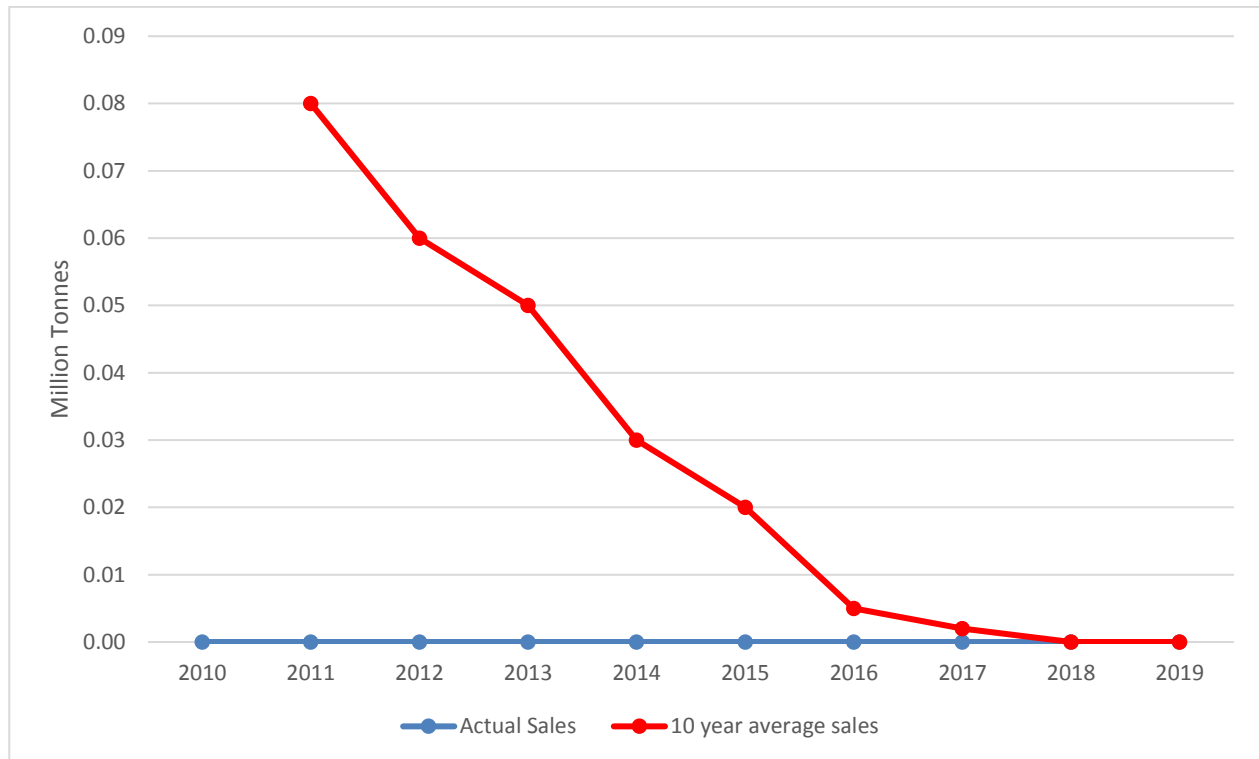
¹ Source: Aggregate Minerals Survey 2018, conducted by the Department of Communities and Local Government

² Minerals Products Association

Crushed rock (including aggregate limestone)

- 3.19 Crushed rock sales (predominately aggregate limestone) in Nottinghamshire have stood at zero over the majority of the 10-year period. This lack of sales continued in 2019. (see figure 5 below).

Figure 3: Sales of aggregate limestone, 2010-2019 against 10-year average sales figure. (Figures in million tonnes)



Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sales (million tonnes)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Resources and landbank

- 3.20 Nottinghamshire only has one dedicated aggregate limestone quarry (at Nether Langwith). The quarry was originally opened to supplement a much larger quarry in Derbyshire, however it has been mothballed since 2007. Some aggregate is also produced from reject stone at a building stone quarry at Linby although this tonnage is small. Permitted reserves currently total 3.34 million tonnes, with average sales over the last 10 years standing at zero. Given that no aggregate is currently being worked, a landbank figure has not been calculated as it gives an unrealistically large figure.

Imports and exports of crushed rock

- 3.21 Limestone resources in Nottinghamshire and Nottingham are relatively limited therefore all crushed rock is imported. The 2014 Full East Midlands Annual Minerals Survey states that 1.26 million tonnes of crushed rock was imported into Nottinghamshire, whilst no mineral was exported.
- 3.22 The survey identified Leicestershire, Derbyshire (including the Peak District National Park Authority) and Yorkshire and Humberside (predominately Doncaster Metropolitan Borough Council) as the main sources of crushed rock.
- 3.23 The Leicestershire LAA (2020, containing 2019 sales data) states that adequate reserves are available to meet expected future demand over the plan period. The Derbyshire LAA also states that adequate reserves remain available to meet expected future demand from outside Derbyshire. This takes into account the reduction in output from the Peak District National Park. The Doncaster and Rotherham LAA (2019) identifies a 31.4-year landbank for crushed rock based on 2018 figures. The Humber LAA (2019) also states that adequate reserves remain, with a 24.81-year landbank for crushed rock.

Table 7: Crushed rock imports into Nottinghamshire, 2014, (tonnes)

Origin	2014 ('000s tonnes)
Derbyshire and Peak District National Park	253
Leicestershire	822
Doncaster	190
North Lincolnshire	63
Other (Gloucestershire, Cambridgeshire, Lincolnshire, Shropshire, Warwickshire, Cumbria, Yorkshire Dales, Durham, Northumberland)	60
TOTAL	1.26*

*Due to the approximate figures used imports don't total exactly.

Alternative aggregates

- 3.24 Production figures for secondary and recycled aggregates are limited to national estimates. Since 1980 there has been a significant increase in annual alternative aggregate production in Great Britain (GB), rising from 20 million tonnes to a high of 71 million tonnes in 2007 (25% of total aggregates sales). Sales of recycled aggregates mirrored the fall of sales of primary aggregates nationally during the recession, however sales of both primary and recycled aggregates have been increasing since the recession. In 2018 sales of recycled aggregates stood at 71 million tonnes (28% of total aggregates sales)³. Britain still has the highest rate in Europe for recycling aggregates and it is estimated that alternative aggregates use in GB is around three times higher than the European average.

³ Minerals Products Association – Profile of the UK Minerals Products Industry 2020 edition

- 3.25 The British Geological Survey and Minerals Products Association acknowledge that further significant growth is likely to be limited due to the high levels that are already being recycled along with changing construction methods which are also likely to reduce the availability and quality of these materials in the future.
- 3.26 Local data for alternative aggregates is very limited however the main types of alternative aggregates in Nottinghamshire are set out below:

Power station ash

- 3.27 Fly ash and furnace bottom ash (FBA) from power stations can be used as alternatives to virgin aggregates in the manufacture of concrete, cement and other construction materials. Nottinghamshire did have three power stations which produced around 1.7 million tonnes of ash each year in 2014⁴. There is limited local information as to how much of the ash is sold, but nationally around 70 per cent of total fly ash and 100 per cent of FBA produced in 2014 was sold for use in construction products and engineering materials. The remaining material is often stored in stockpiles and can be sold at a later date⁵.
- 3.28 In line with the Governments goal to close all coal fired power stations by 2025 and replace these with other types of power generation, one of Nottinghamshire's power stations, Cottam, closed in September 2019. The availability of power station ash therefore is likely to have fallen in Nottinghamshire and will continue to do so in the future.

Construction and demolition waste

- 3.29 Construction and demolition waste is made up of a range of materials including rubble, metals, glass, plastic and other construction materials.
- 3.30 National estimates suggest that around 80-90% of construction and demolition waste is re-used or recycled. Old concrete and rubble is often crushed on site using mobile processing plant and used in situ as bulk fill. The remainder of the materials such as metal is taken off site and sent to be processed elsewhere.
- 3.31 Taking and adapting the DEFRA reconcile methodology to calculate national arisings of construction and demolition waste, the Council has calculated construction and demolition waste arisings for Nottinghamshire and Nottingham as part of the background evidence for its emerging Waste Local Plan. This estimates that in 2019, Nottinghamshire and Nottingham generated 1,186,000 tonnes of Construction and Demolition waste.
- 3.32 There are currently 15 dedicated aggregates recycling facilities which have a maximum permitted capacity of 1.7 million tonnes. There are also 22 general transfer facilities which are able to handle construction and demolition waste but no separate data on capacity is available.

⁴ East Midlands Aggregate Working Party - Annual Survey and Report 2014

⁵ UK Quality Ash Association

- 3.33 Worn out rail ballast is taken by rail to recycling centres for crushing into aggregate. As this material comprises high quality limestone or granite it can be re-processed for high-grade uses. There are approximately 7 rail ballast recycling sites across the country. One of these is located at Toton railway sidings in Stapleford. Table 8 sets out annual throughputs.
- 3.34 Road planings produced as a result of highway resurfacing schemes can be used as a recycled aggregate to form a range of surfaces such as car parks, driveway or tracks. The availability of this material will vary depending on the level of highway maintenance being carried out at any given time.
- 3.35 Table 8 sets out estimates for the amount of inert waste (considered suitable for recycled aggregates) that has passed through permitted recycling and transfer facilities in Nottinghamshire⁶. The figures show that over the 10-year period, throughput hit a low in 2010 before steadily increasing and levelling out since 2014.

Table 8: Throughputs of inert waste (considered suitable for recycled aggregates) at permitted recycling and transfer facilities.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ballast recycling facility, Toton. (million tonnes)	0.31	0.26	0.18	0.05	0.11	0.10	0.13	0.15	0.13	0.11	0.15	0.12	0.14
All other sites (million tonnes)	0.09	0.08	0.20	0.08	0.10	0.21	0.28	0.32	0.34	0.37	0.29	0.36	0.36
Total (million tonnes)	0.40	0.34	0.38	0.13	0.21	0.31	0.41	0.47	0.47	0.48	0.45	0.48	0.50

- 3.36 No sales data exists for specific types of recycled or secondary aggregates. However, as these types of aggregates are available on the open market, their contribution is already taken into account when calculating future demand for primary aggregates.
- 3.37 Planning policies relating to recycled and secondary aggregates can be found in the Nottinghamshire & Nottingham Waste Core Strategy (adopted December 2013).

⁶ Data sourced from the Environment Agency Waste Data Interrogator

Local production conclusion

- 3.38 Compared to historic (pre-2007) sales of sand and gravel and Sherwood Sandstone, the 2019 sales data clearly reflects the continued subdued nature of sales from Nottinghamshire. The figures also reflect the lack of new quarries becoming active which would have replaced worked out quarries
- 3.39 At the end of 2019, Nottinghamshire's sand and gravel landbank was above the 7-year minimum requirement. Whilst sufficient at present, as identified within the adopted Nottinghamshire Minerals Local Plan (March 2021) further reserves will be needed over the life of the Plan, to 2036, to ensure Nottinghamshire has a steady and adequate supply. The plan therefore allocates sites to meet this demand, which includes 5 extensions to existing quarries and one new greenfield site as detailed in Policy MP2. As the forecast of demand for sand and gravel over the plan period was based upon the production figure of 1.7 million tonnes required annually (Policy MP1), with the current 10 year sales average at 1.47 million tonnes and the 3 year sales average at 1.44 million tonnes, the plan will still ensure adequate provision.
- 3.40 Exports of both sand and gravel and Sherwood Sandstone are likely to remain a significant proportion of sales. This trend is likely to continue over the next plan period as sand and gravel resources, particularly those in Rotherham and Doncaster, are limited.
- 3.41 At the end of 2019, Nottinghamshire has sufficient permitted reserves of Sherwood Sandstone to meet the 7-year minimum landbank. Further reserves will, however, need to be released over the life of the Nottinghamshire Minerals Local Plan to 2036, as existing quarries are worked out. Sites are therefore allocated within Policy MP3 of the Plan. The forecast of demand for Sherwood Sandstone was based upon the production figure of 0.37 million tonnes required annually (Policy MP1). Whilst the 3 year sale average is slightly higher than this, at 0.41 million tonnes, there will still be adequate provision for Sherwood Sandstone over the plan period, with the plan supporting unallocated sites to come forward should a need be demonstrated (Policy MP1).
- 3.42 Crushed rock sales remain at zero with the county's needs being met by imports from adjoining counties. At the end of 2019, the landbank was technically well above the minimum 10-year landbank, however this figure should be treated with caution as sales have been at zero for a number of years.
- 3.43 Recycled and secondary aggregates continue to play an important role in meeting wider aggregate demand, however the ability of recycled aggregates to replace primary aggregates will be dependent on a range of issues such as availability, cost, and the technical specifications required for specific end uses. As these types of aggregates are available on the open market, their contribution is already taken into account when calculating future demand for primary aggregates.

Future Aggregate Provision

- 4.1 In order to provide a steady and adequate supply of aggregates over the plan period, the NPPF states that a LAA should be prepared based on the last 10 years average sales data and taking into account any important local considerations and national and sub national guidelines.

National and Sub-National Aggregate Guidelines

- 4.2 Prior to the introduction of the NPPF, the supply of land-won aggregates in England was based on national and sub national guidelines for aggregates provision published by the Department for Communities and Local Government (DCLG). The most recent guidelines covering the period 2005-2020 were published in 2009.
- 4.3 The East Midlands Aggregate Working Party used these guidelines to produce draft apportionment figures for each MPA. The figures were then approved by the East Midlands Regional Assembly in 2010 and were to be incorporated into the Regional Plan via the review process. However due to the abolition of the Regional Spatial Strategy the figures were never adopted.
- 4.4 The guidelines for the East Midlands stood at 174 million tonnes for sand and gravel and 500 million tonnes for crushed rock over the 2005-2020 period. For Nottinghamshire the guidelines were equivalent to 3.81 million tonnes per annum (a combined figure for sand and gravel and Sherwood Sandstone).
- 4.5 It was decided at the Aggregate Working Party meeting in February 2013 that the draft 2009 figures were considered out of date as they were only based on aggregate output from a period of economic growth, and should, therefore, not be taken into account when determining the new apportionment figures.
- 4.6 Long term demand for aggregates to be provided for in the Minerals Local Plan will be reviewed annually through the LAA using the 3 and 10-year sales averages as the key evidence base specifically monitoring trends. Annual monitoring of the Local Plan will also take place based on the updates to the LAA and if required early review may be necessary.

Sand and gravel provision

- 4.7 The biggest planning issue for Nottinghamshire and Nottingham is the long-term provision of sand and gravel over the plan period.
- 4.8 Based on the most recent data, the 10-year average figure stands at 1.47 million tonnes. This figure has steadily fallen since the first LAA was produced in 2013 and reflects the loss of higher pre-recession sales figures and the greater influence of lower sales figures since. The three-year average figure has also slowly fallen since the first LAA was produced, however the latest figure is slightly higher than previous years at 1.44 million tonnes. Table 9 sets out the average production figures.

Table 9: Sand and Gravel average sales figures

	2013 LAA (2002- 2011)	2014 LAA (2003- 2012)	2015 LAA (2004- 2013)	2016 LAA (2005- 2014)	January 2017 LAA (2006- 2015)	October 2017 LAA (2007- 2016)	May 2019 LAA (2008- 2017)	Dec 2019 LAA (2009- 2018)	Current LAA (2010- 2019)
10-year average sales (million tonnes)	2.58	2.43	2.24	2.05	1.89	1.7	1.53	1.46	1.47
	(2009- 2011)	(2010- 2012)	(2011- 2013)	(2012- 2014)	(2013- 2015)	(2014- 2016)	(2015- 2017)	(2016- 2018)	(2017- 2019)
3-year average sales (million tonnes)	1.51	1.61	1.55	1.46	1.45	1.4	1.36	1.38	1.44

Resource depletion in the Idle Valley and the north of the County

- 4.9 The Idle Valley, located in the north of the County, has a long history of sand and gravel extraction. Traditionally a large proportion of this, 30%, has supplied markets in Rotherham and Doncaster due to its close proximity and limited mineral reserves elsewhere.
- 4.10 Resource depletion is now starting to limit output, and since 2006 the number of active quarries has fallen from 8 to 5. This has seen output fall, with some of the reduction in output due to the delay in implementing the permitted quarry at Sturton Le Steeple.
- 4.11 The impact of resource depletion in the Idle Valley on the Rotherham and Doncaster markets is discussed further in the following chapter.

Marine won sand and gravel

- 4.12 Marine won sand and gravel is not used in Nottinghamshire due to the availability of locally sourced land won material and the high costs involved in transporting the mineral long distances. It is therefore assumed that marine sources are not a significant issue for Nottinghamshire and will therefore not form part of this assessment.

Sherwood Sandstone provision

- 4.13 Sherwood Sandstone sales are much lower than sand and gravel and historically have been in steady decline. Since 2017 the 10-year average has remained relatively stable, fluctuating between 0.39 and 0.36. The latest 3-year average, at 0.41 million tonnes, shows production recently has increased slightly, with this being the highest 3-year average since the first LAA was produced. Table 10 sets out the average sales figures.

Table 10: Sherwood Sandstone average sales figures

	2013 LAA (2002- 2011)	2014 LAA (2003- 2012)	2015 LAA (2004- 2013)	2016 LAA (2005- 2014)	January 2017 LAA (2006- 2015)	October 2017 LAA (2007- 2016)	May 2019 LAA (2008- 2017)	Dec 2019 LAA (2009- 2018)	Current LAA (2010- 2019)
10-year average sales (million tonnes)	0.46	0.44	0.42	0.40	0.39	0.37	0.36	0.36	0.37
	(2009- 2011)	(2010- 2012)	(2011- 2013)	(2012- 2014)	(2013- 2015)	(2014- 2016)	(2015- 2017)	(2016- 2018)	(2017- 2019)
3-year average sales (million tonnes)	0.33	0.34	0.35	0.35	0.37	0.35	0.33	0.38	0.41

- 4.14 No additional specific local factors have been identified when considering the future apportionment for Sherwood Sandstone.

Crushed rock (limestone) provision

- 4.15 Crushed rock (limestone) is only worked from one quarry in Nottinghamshire and production has been limited due to the seasonal working of the site and abundance of limestone worked in Derbyshire and Leicestershire.
- 4.16 The most recent 10 and 3-year average figures stand at zero tonnes (see Table 11).

Table 11: Crushed rock average sales figures

	2013 LAA (2002- 2011)	2014 LAA (2003- 2012)	2015 LAA (2004- 2013)	2016 LAA (2005- 2014)	January 2017 LAA (2006- 2015)	October 2017 LAA (2007- 2016)	May 2019 LAA (2008- 2017)	Dec 2019 LAA (2009- 2018)	Current LAA (2010- 2019)
10-year average sales (million tonnes)	0.08	0.06	0.05	0.03	0.02	0.005	0.002	0.00	0.00
	(2009- 2011)	(2010- 2012)	(2011- 2013)	(2012- 2014)	(2013- 2015)	(2014- 2016)	(2015- 2017)	(2016- 2018)	(2017- 2019)
3-year average sales (million tonnes)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Future provision

- 4.17 A pre-cast concrete factory was built near Worksop in 2009 and produces concrete structures on site for delivery and installation at construction sites. The factory uses crushed limestone as part of the production process.
- 4.18 No recent data on consumption is available however this was previously around 40,000 tonnes per annum. The factory is currently supplied by quarries in Derbyshire as the only limestone quarry in Nottinghamshire is mothballed.

Future aggregate provision conclusion

- 4.19 National guidance states that consideration should be given to the national and subnational demand forecasts, however these are now considered out of date as they were based purely on a period of economic growth over a shorter timescale than the 10-year sales average stated in the NPPF.
- 4.20 The 10-year sales average for sand and gravel has now begun to flatten out as higher pre-recession figures have fallen out of the data and current quarrying output in Nottinghamshire remains flat. The 3-year average sales figure indicates a small increase in the last three years. Based on the latest 10- and 3-year average sales data, there is no evidence to suggest that the demand forecast as set out in the adopted Minerals Local Plan needs to be reviewed.
- 4.21 The 10 years sales average for Sherwood Sandstone has slowly fallen, although it remains more stable than sand and gravel sales. The on the latest 10- and 3-year average has remained generally flat but has increased in 2018 and 2019. Based on the average sales data, there is no evidence to suggest that the demand forecast as set out in the Minerals Local Plan needs to be reviewed.

- 4.22 Crushed rock sales remain at zero as the majority of material used in Nottinghamshire is imported from adjoining authorities. Based on the current sales data it is not considered necessary to identify additional reserves.
- 4.23 Resource depletion in the Idle Valley along with continued demand from Rotherham and Doncaster will remain a long-term issue, however in the short-term adequate reserves remain.
- 4.24 The potential use of marine sourced sand and gravel is not a significant issue for Nottinghamshire due to the availability of locally sourced land won mineral and the significant additional cost in transporting marine sourced minerals greater distances.

Future Growth

National Infrastructure Projects identified for Nottinghamshire

- 5.1 The 2016 National Infrastructure Plan identified two infrastructure schemes for Nottinghamshire; the Midland Mainline electrification (MME) programme estimated to start in 2019 and the A1/A46 junction improvements near Newark estimated to start between 2020 and 2025. However, in July 2017 the Department for Transport announced that the MME from Kettering to Leicester, Derby and Nottingham has been cancelled. The A1/A46 junction improvements have also been put back to around 2027.
- 5.2 Another National project within the area is the High-Speed Rail 2 line (HS2), with the proposed phase 2b route passing along the western boundary of the county and the East Midlands Hub, located at Toton, also falling within the county area. There is no date set for the start of construction at present. At this stage it is difficult to quantify the amount of aggregates for the section of the line in Nottinghamshire, with estimates of 30-40 million tonnes of aggregates for the phase 2b of the HS2 project.
- 5.3 It is likely that the schemes above will increase demand for minerals in Nottinghamshire. However, given the current lack of detail, the amount of minerals required is uncertain. Future LAAs will continue to monitor progress on these schemes and update the LAA as necessary.

Annual Minerals Raised Inquiry survey

- 5.4 The Annual Minerals Raised Inquiry (AMRI) survey is an annual survey undertaken by the Office for National Statistics which collects, collates and publishes a comprehensive set of statistics for the production of minerals. The survey covers all mineral working sites across the whole of Great Britain. The most recent version was published in March 2016 and includes 2014 data.
- 5.5 The data contained in the previous versions of the AMRI show that national sales of sand and gravel hit a low in 2012 of just over 50 million tonnes, however sales have increased since, and in 2014 stood at just over 56 million tonnes. Sales of crushed rock hit a low of just under 91 million tonnes in 2012, however sales have increased since, and in 2014 stood at just under 105 million tonnes.
- 5.6 The AMRI since 2016 has been discontinued with Prodcorn now collating information on other mining and quarrying data. In their 2017 provisional results, sales in other mining and quarrying had risen by £0.2 billion, increasing from £1.9 billion in 2016 to £2.1 billion in 2017.

East Midlands Aggregates Working Party – Annual Monitoring Report 2019

- 5.7 The EMAWP Annual Monitoring Report collates data relating to aggregates sales for each Minerals Planning Authority in the East Midlands. (The sales data for Nottinghamshire has been used in this report). Prior to the recession, in 2007 sand and gravel sales in the East Midlands stood at 8.91 million tonnes before falling to a low of 5.5 million tonnes in

2009 as a result of the recession. Since 2009, sales then steadily increased to 6.95 million tonnes in 2016 before falling back slightly to 6.79 million tonnes in 2017. Sales in 2018 increased to 7.15 million tonnes, up 5% on the previous year.

- 5.8 Although Nottinghamshire produces very little crushed rock, it is useful to monitor sales across the East Midlands as a wider indicator of demand. In 2007 crushed rock sales stood at 30.7 million tonnes. Unlike sand and gravel, sales did not reach a low point until 2012 when sales stood at 19.74 million tonnes. Between 2012 and 2017 sales steadily increased to 28.41 million tonnes. Sales in 2018 decreased to 27.83 million tonnes.

Population forecasts

- 5.9 The population of Nottinghamshire (the geographic County, including Nottingham City) is expected to grow from 1.14 million in 2017 to 1.25 million in 2036 (Minerals Local Plan period) based on 2014 Office of National Statistics data. Development associated with this growth is likely to be focused around the existing major urban areas of the Nottingham conurbation, Newark and Mansfield, however it is difficult to make direct comparisons between population growth and minerals use.

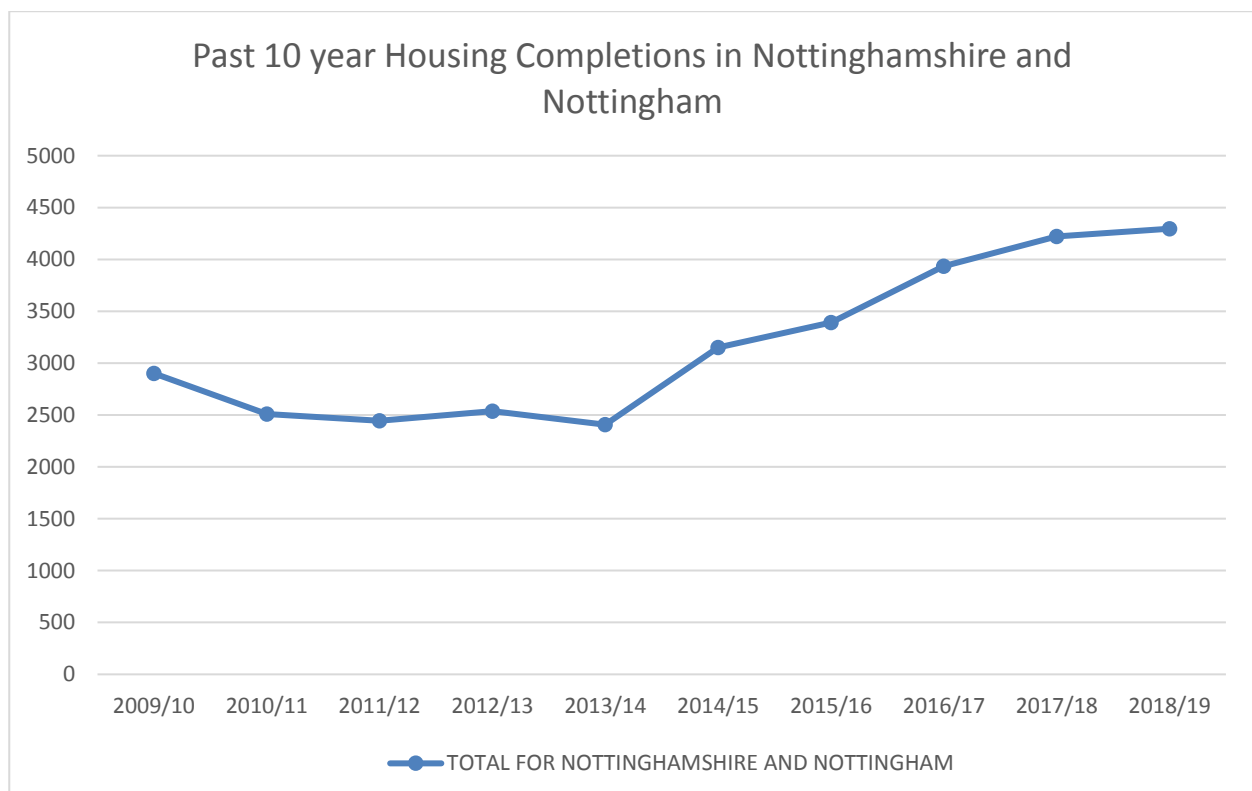
House building

- 5.10 The current government has a key objective to ensure that there is an adequate provision of housing across the country to resolve the housing crisis. Within Nottinghamshire, the seven District and Borough's within their Local Plans/core strategies along with Nottingham City Council Local Plan must ensure that the identified local housing needs are being met and will be in the future.
- 5.11 Based on the most recent 10-year housing trajectory data available from the districts (table 12) house building rates in Nottingham and Nottinghamshire are forecasted to peak in 2020/2021 at 8070 before steadily falling back to 4412 in 2027/2028.
- 5.12 Forecasting 8070 dwellings in 2020/21 is ambitious when considering the previous 10-years housing completions, with completions in the past three years reaching half of this at around 4000 dwellings per annum as shown in Figure 4. The housing completions figures are likely to reflect the local economic conditions and will be monitored against the 10-year trajectories.

Table 12: 10-year housing trajectories

10 YEAR HOUSING TRAJECTORY PER DISTRICT								
	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28
Ashfield	205	222	467	287	202	495	303	137
Bassetlaw	576	697	676	573	457	638	543	298
Broxtowe	1079	1019	768	1014	590	315	260	210
Gedling	476	665	853	852	767	663	559	398
Mansfield	458	326	327	397	715	789	715	613
Newark	528	685	618	509	428	657	877	891
Nottingham city	3541	2400	1224	1247	1420	1627	1365	1156
Rushcliffe	1207	1446	1314	1292	1151	885	710	709
TOTAL	8070	7460	6247	6171	5730	6069	5332	4412

Figure 4: Housing completions in Nottinghamshire



- 5.13 During the construction of new houses, a range of aggregate minerals will be consumed including sand and gravel for uses such as concrete, Sherwood Sandstone for mortar, clay for bricks and tiles along with crushed rock for more general construction uses. Data from the Minerals Products Association estimates that a typical new house uses up to 50 tonnes of aggregates, although the actual quantities for each type of aggregate are

unclear. It is also worth noting that the Minerals Products Association estimate that new house building only accounts for around 20% of overall aggregate consumption.

Future demand from the Rotherham and Doncaster markets

- 5.14 The Rotherham and Doncaster Local Aggregates Assessment 2019 (2018 data) states that whilst its sand and gravel landbank stands at 17 years there are limited reserves of sharp sand remaining in the area, with this only being 23% of the landbank and that current permitted reserves may not be adequate to cover the plan period to 2028. Therefore, the authority will continue to rely on the import of sand and gravel from Nottinghamshire and other neighbouring authorities.
- 5.15 Given that Nottinghamshire has traditionally supplied a large proportion of sand and gravel to the Rotherham and Doncaster markets from the Idle Valley and North Nottinghamshire, their future requirements are unlikely to be completely new demand and this has been taken into account as part of the 10 year average sales figures. It is likely that in the short term, output from the Idle Valley and north Nottinghamshire will be maintained at current levels from existing permitted reserves.
- 5.16 A planning permission at Sturton Le Steeple with an estimated output of 500,000 tonnes per annum (including circa 150,000 tonnes per annum potential river barge transportation) was formally implemented in the first half of 2017 but has yet to come into active production due to delays in installing site infrastructure. If this quarry was fully operational it would provide a valuable long-term source of sand and gravel to supply North Nottinghamshire and the Rotherham and Doncaster markets for approximately 20 years.
- 5.17 A call for sites exercise was undertaken as part of the new Minerals Local Plan evidence base which identified any remaining sand and gravel reserves in the Idle Valley that the industry wishes to be considered for allocation.
- 5.18 Longer term, output from the Idle Valley is likely to fall as the remaining resources are used up and this will be monitored through the LAA process. If sand and gravel from Nottinghamshire continues to supply this market in the longer term, it would need to be sourced from the Trent Valley close to Newark, a significantly greater distance from the markets. In this latter scenario other resources outside of Nottinghamshire may start to become increasingly viable for South Yorkshire markets, however at this stage it is difficult to predict the extent of this.
- 5.19 Paragraph 73 of the draft Rotherham and Doncaster 2016 LAA also notes that in 2014 half the crushed rock sales in the Boroughs were used for concreting aggregate, identifying a potential transition away from sharp sand to crushed rock for concreting products. If this is the case this could reduce the long-term demand for sharp sand for concreting purposes.

Future demand from Leicestershire

- 5.20 The 2021 Leicestershire LAA, containing 2019 sales, states that the existing sites have a total potential production capacity of around 1.59 million tonnes per annum, which means that they would be capable of producing sufficient material to satisfy the level of provision identified in the adopted Minerals and Waste Local Plan. The sites would not however be able to meet the County's future requirements without the benefit of extensions to their permitted operations. Given sand and gravel landbank currently stands at 2.6 years additional sand and gravel may need to be sourced from reserves outside the county.
- 5.21 Some sand and gravel is already exported from Nottinghamshire to Leicestershire and in 2018 exports stood at 166,000 tonnes.
- 5.22 In the future additional sand and gravel from Nottinghamshire could potentially serve Leicestershire, however at this stage it is difficult to quantify the amount as it will depend on the actual shortfall in the future and the amount of sand and gravel being supplied by other Mineral Planning Authorities such as Lincolnshire and Derbyshire.
- 5.23 It is important to note the LAA is reviewed annually and an Annual Monitoring Report is prepared by the County Council to monitor the effectiveness of the Local Plan.

Future growth conclusion

- 5.24 National sales of aggregates (up to 2014) have steadily increased since the low experienced in 2012. This has also been the case (up to 2017) across the East Midlands area. This would suggest that demand for aggregates is increasing across the board however this is not the case in Nottinghamshire as sales have remained flat in 2017. The reasons for this have been set out earlier in the document.
- 5.25 No additional infrastructure projects have been identified since the last LAA was published. The existing projects include HS2 rail project, the A46/A1 road improvements and the remainder of the East Midlands Freight depot. Although these projects are likely to increase demand for aggregate, it is not possible at this stage to quantify the amount of additional aggregates that are likely to be needed from within the County.
- 5.26 The population of Nottinghamshire is expected to increase steadily over the plan period potentially increasing demand for the supply of aggregates although it is not possible to quantify this. Planned house building rates across Nottinghamshire are forecast to increase in 2020/2021 before steadily falling in 2024/2025, however this should be monitored against actual housing completions as these will better reflect the health of the economy. House building is likely to contribute to overall demand for aggregates although it is just one element that needs to be considered.
- 5.27 Demand for sand and gravel from Rotherham and Doncaster is likely to continue into the future as sand and gravel resources are limited in this area. Remaining reserves within the Idle Valley will meet short term demand, however in the long term as this sand and gravel resource becomes worked out, sand and gravel will have to be transported further from elsewhere.

- 5.28 Demand for additional sand and gravel from Leicestershire may increase in the future, however at present its unclear as to the quantities that maybe needed and the timescales for this. To a certain extent demand will also depend on future economic conditions.
- 5.29 Based on the information available, it is not considered necessary to identify additional aggregate reserves to meet future growth over the plan period.

Conclusion

- 6.1 The provision of sand and gravel is the biggest issue for Nottinghamshire and Nottingham over the plan period. The 10-year sales average has fallen from 1.7 million tonnes in the LAA published in 2013 to 1.47 million tonnes in this LAA. This is largely due to the fall in sales due to the recession in 2007 and the continued subdued sales since, even though significant sand and gravel resources remain in the Trent Valley.
- 6.2 Additional reserves will need to be needed over the plan period to 2036 to replace existing quarries as they are worked out. The newly adopted Minerals Local Plan allocates a mix of extensions to existing permitted quarries and one new quarry.
- 6.3 No major infrastructure projects are planned in the short term, however longer term, the proposed route of the HS2 and the potential highway improvements to the A46/A1 junction and the A46 near Newark could increase demand for aggregates. An increase in house building is forecast, however, housing completion rates are likely to be more unpredictable as they will be dependent on the economy.
- 6.4 Resource depletion in the Idle Valley is likely to be the biggest factor potentially influencing exports to South Yorkshire. The extent of the impact will depend on the level of demand, due to economic conditions, the status of Sturton Le Steeple quarry and the increasing trend of replacing sharp sand with crushed rock in concreting products. However, it is likely that sand and gravel will either be sourced from quarries around Newark or from other areas outside of Nottinghamshire that may be closer.
- 6.5 Demand for additional sand and gravel from Leicestershire may increase in the future however at present its unclear as to the quantities that maybe needed and the timescales for this. To a certain extent demand will also depend on future economic conditions. As a result this will be monitored through annual sales and future Aggregate Working Party full survey minerals movement data.

- 6.6 Sherwood Sandstone sales are much lower than sand and gravel sales, with a slight increase in sales since 2018. Additional reserves will be needed over the plan period and as part of the draft mineral plan extensions to the existing permitted quarries have been identified.
- 6.7 The importation of crushed rock from adjoining areas to meet the County's needs is set to continue as limestone sales from Nottinghamshire remain at zero. The permitted but mothballed quarry at Nether Langwith contains permitted reserves and could be re-opened by the operator to meet additional demand in the future.
- 6.8 Recycled and secondary aggregates continue to play an important role in meeting wider aggregate demand, however the ability of recycled aggregates to replace primary aggregates will be dependent on a range of issues such as availability, cost, and the technical specifications required for specific end uses. As these types of aggregates are available on the open market, their contribution is already taken into account when calculating future demand for primary aggregates.
- 6.9 The LAA will be reviewed annually taking account of the most recent aggregate sales data and any other relevant local data. This will ensure that there is an adequate and steady supply of aggregate minerals provided over the plan period and that any fluctuations in future requirements can be addressed.