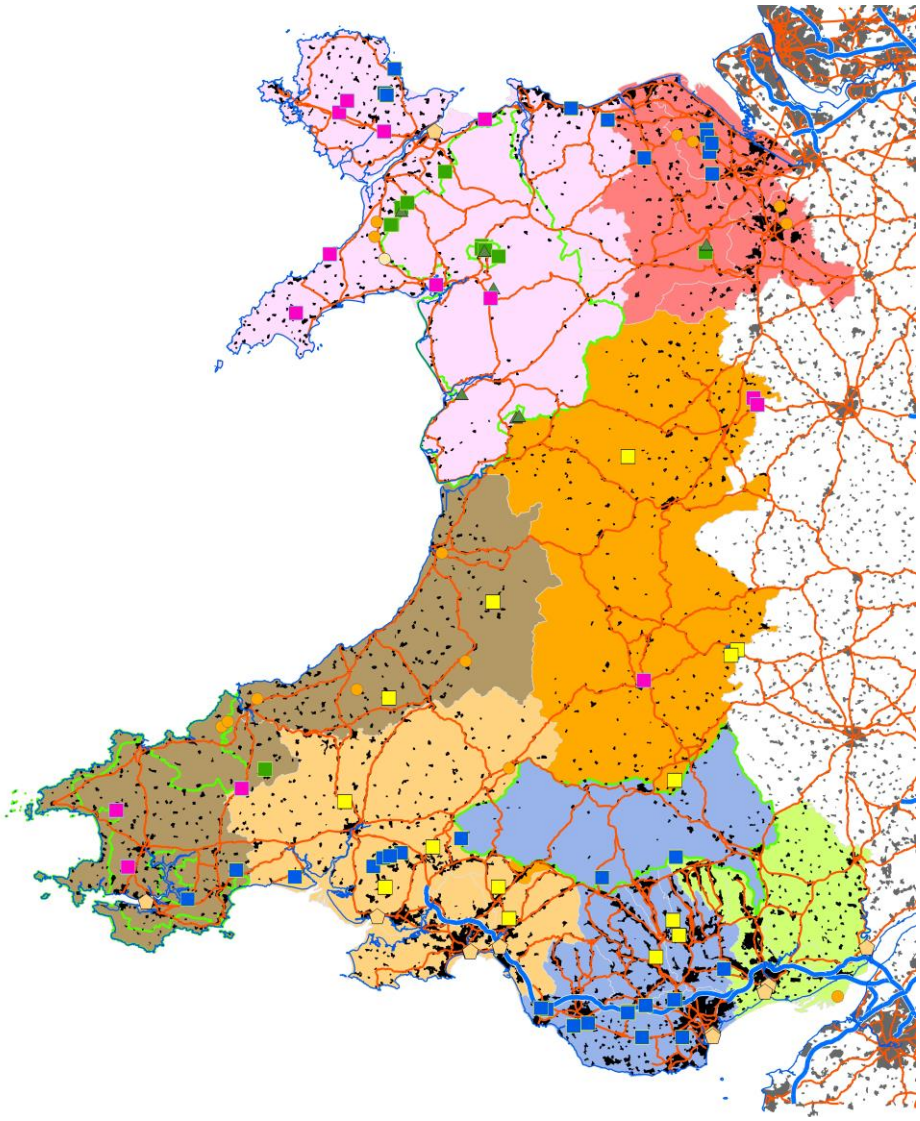
Regional Technical Statements

for the North Wales and South Wales
Regional Aggregate Working Parties

- 2nd Review -

(Main Document)



Consultation Draft, August 2019

North Wales Regional Aggregates Working Party

Llywodraeth Cymru
Welsh Government

South Wales Regional Aggregates Working Party

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Foreword

(to be added by the Chairs of each RAWP).

… … …

Chair of the South Wales Regional Aggregates Working Party.

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Chair of the North Wales Regional Aggregates Working Party.

Date……..

Statement from the Minister for Energy, Planning & Rural Affairs

To be Added.

Executive Summary

Minerals Technical Advice Note 1: Aggregates (2004) (MTAN 1) requires the preparation of Regional Technical Statements (RTS) for the areas covered by both the South Wales and North Wales Regional Aggregates Working Parties (RAWPs). Whereas MTAN1 develops the national policy set out originally in Minerals Planning Policy Wales (now part of Planning Policy Wales - PPW), the RTS provides the supporting detail which allows this to be implemented.

The original RTS documents for both regions were completed in 2008 and are required, by MTAN 1, to be reviewed every five years. The First Review was undertaken in 2013/2014 and this, the Second Review, commenced in 2018.

In contrast with the former guidelines for aggregate provision issued for England and Wales, prior to devolution, the RTS process has always avoided any attempt to make detailed forecasts of future demand based on econometric modelling. In the past, these had been found to be unreliable and were criticised for their lack of transparency. Instead, a series of alternative approaches have been used in Wales and each 5-yearly review of the RTS provides opportunities for further refinement.

The methodology used in the previous (First) Review, in 2014, had been based primarily on historical sales averages, combined with an assessment of the various 'drivers' of potential future change. For the Second Review, this has been combined with an attempt to reflect *planned* future requirements for housing construction activity, and to avoid perpetuating historical supply patterns in areas where there is scope to encourage more sustainable patterns of supply.

A key factor in the new methodology has been recognition that future housing requirements, in all Local Authority areas in Wales, are more than double the average levels of house completions seen over the last 10 years, and that a corresponding increase in the planned provision of construction materials associated with house construction should therefore be allowed for. This is not necessarily a prediction of future demand, since the housing figures set out in adopted Development Plans will only materialise if economic conditions allow. There is, however, a clear logic in linking the planned provision of aggregates with that for housing, to ensure that housing plans are not thwarted by an under-provision of aggregates.

At a national scale, Welsh statistics have revealed a very high degree of correlation between housing completions and aggregate sales. Other statistics (for GB as a whole) show that housing accounts for approximately 30% by value of all new construction. Putting both of these observations together, the implication is that a doubling of house construction would necessitate a doubling of that 30% element of aggregate sales. At a national level, therefore, and on the basis of being consistent in terms of planned provision for both housing and aggregates, the RTS Steering Group[1] has agreed that the provision required for aggregates should be guided by a 30% uplift on historical sales figures.

[1] comprising Welsh Government, the two RAWP secretaries, National Resources Wales, the Mineral Products Association, the British Aggregates Association and representatives of one local authority from each Region.

A further consideration agreed by the Steering Group was that the historical sales figures should reflect, not just the 10-year average (as had been used in the First Review, and as required by the NPPF, in England), but the highest of the 10-year and 3-year averages for each individual LPA. This reflects the fact that in some parts of Wales – notably in the Cardiff City Region – there has been a marked upsurge in construction activity in recent years, and a corresponding growth in aggregate sales.

In **STAGE 1** of the RTS process, the 30% uplift is applied to this composite historical sales figure to obtain an overall ***National Guideline*** figure for future aggregate production. The uplift is applied only at the national level, because the relationship between construction activity and aggregate sales breaks down at more detailed levels (this being primarily because of the spatial differences between areas of supply and demand).

In **STAGE 2** of the process, the National figure is broken down into two ***Regional Guideline*** figures (based simply on the historical split of total land-won primary aggregate sales between North and South Wales, which has remained reasonably consistent over many years).

In **STAGE 3**, the regional figures are then apportioned between a series of seven '***sub-regions***', as shown below and, *provided that it is feasible to do so*, between each of the constituent Local Planning Authorities (LPAs). The sub-regions were created, at Welsh Government's suggestion, for the specific purpose of facilitating strategic minerals planning and collaborative approaches between LPAs. They each represent distinctive 'market areas' between which there is relatively little movement of aggregates, except for exports to England, and within which detailed, strategic consideration can be given as to the most appropriate patterns of supply.

In most cases, the distribution of apportionments within each sub-region is achieved through a combination of *quantitative* and *qualitative* judgements, exercised by the RTS Steering Group and facilitated by the appointed consultant. The judgements seek to reflect the Steering Group's collective understanding of market requirements (reflecting both historical sales and the distribution of planned housing activity) together with considerations of existing landbanks, the proximity principle and environmental capacity.

In a few areas, notably where there has been no production of land-won aggregates for many years, with no permitted reserves and zero apportionments, there is a recognition that it might sometimes be more appropriate for the RTS apportionments to be determined only at the sub-regional level. In such cases, the requirements for individual LPAs are identified as *indicative* figures only and are subject to more detailed investigation by the LPAs involved and to industry responses to future calls for sites.

In sub-regional areas where some individual LPAs are unable to meet their indicative apportionments, there is a need for all of them to collaborate in order to ensure that the overall sub-regional apportionments are still met. To this end, this Review introduces a requirement for all LPAs within the sub-region to agree a Sub-Regional Statement of Collaboration, and for this to be approved by the RAWP, prior to the Examination of any individual LDP within that area.

In the final **STAGE 4** of the process, the total apportionments for each LPA are separated into figures for sand & gravel and crushed rock production (based on historical sales proportions in each LPA). Those figures are then multiplied by the number of years required (22 years for sand & gravel, and 25 years for crushed rock) to obtain the total provision required, in millions of tonnes. Comparison of those figures with existing landbanks and existing unworked allocations then determines the extent to which any new permissions and/or allocations for future working are required within each authority.

In all cases, however, it must be emphasised that the RTS recommendations are intended to be of a **strategic** nature. The documents are not intended to provide site-specific information or guidance. It is for the individual LPAs to determine how the strategic requirements identified in the new RTS should be met within their areas. This includes identifying allocations (where these are required by the RTS or, in some cases, by other local factors), and setting out corresponding policies within their LDPs to guide the Development Management process for future mineral extraction.

Moreover, where it is justified by new (e.g. more up to date, more detailed or more precise) evidence, it is open for individual LPAs to depart from the apportionment and allocation figures recommended by the RTS when preparing their LDP policies. In doing so, however, an LPA would need to demonstrate that their intended departure would not undermine the overall strategy provided by the RTS itself (e.g. by working together with other LPAs within the same sub-region to ensure that sub-regional and regional totals are still achieved) and this would need to be reflected in an approved Sub-Regional Statement of Collaboration for that area, prior to Examination.

Where the local authorities involved are unable to reach agreement, or if individual local authorities do not accept the revised Regional Technical Statement, the Welsh Government will, as a last resort, consider its default powers to intervene in the Development Plan process (MTAN 1, paragraph A3).

1. The Purpose and Objectives of the RTS

Introduction

1.1 Minerals Technical Advice Note 1: Aggregates (2004) (MTAN 1) requires the preparation of Regional Technical Statements (RTS) for the areas covered by both the South Wales and North Wales Regional Aggregates Working Parties (RAWPs) – as shown in Figure 1.1, below. The original RTS documents for both regions were completed in 2008 and are required, by MTAN 1, to be reviewed every five years. The First Review was undertaken in 2013/2014 and this, the Second Review, commenced in 2018.

1.2 The Review comprises this main document and the Regional Appendices for North Wales and South Wales, which are issued separately. The two components of the new RTS for each Region (i.e. the main document and the relevant Appendix) are intended to provide a strategy for the future supply of construction aggregates within that Region, taking account of the latest available information regarding the balance of supply and demand, and current notions of sustainability (see below). Together, the two revised RTSs aim to ensure that an adequate and steady supply of aggregates can be maintained throughout Wales (and beyond, in the case of materials that are exported), taking into account the key objectives of sustainable supply outlined in MTAN 1.

Policy Context and Sustainability Objectives

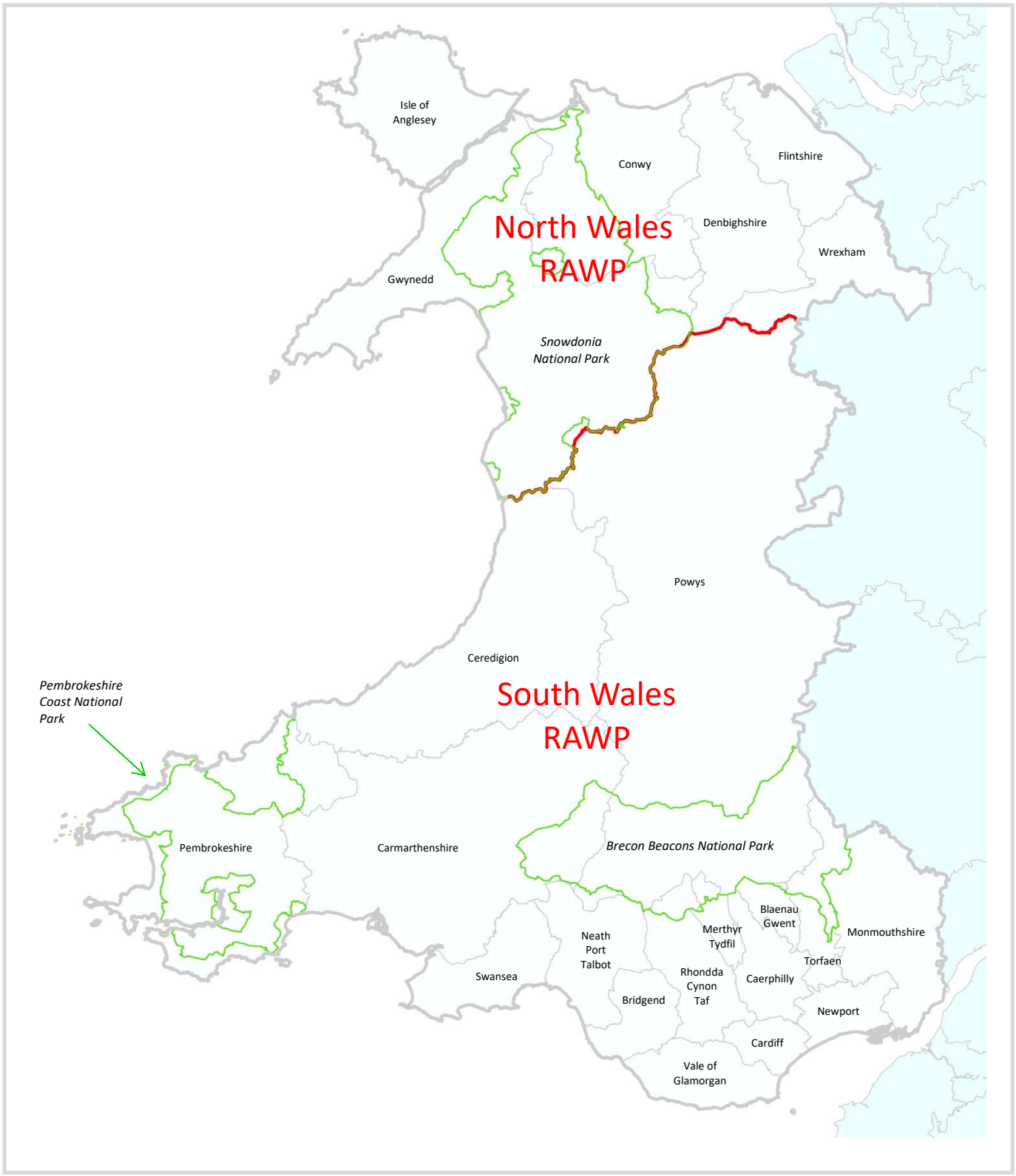
1.3 Since the First Review of the RTS was completed in 2014, there have been some important changes in National legislation and Policy within Wales which have a bearing on mineral development. MTAN 1 – and thus the requirement for Regional Technical Statements to be produced and periodically updated – remains extant, but the former Minerals Planning Policy Wales (MPPW) is now subsumed within Planning Policy Wales (PPW), which itself has been updated several times in response to changing legislation and other factors.

1.4 The most significant legislative change since 2014 has been the **Well-being of Future Generations (Wales) Act 2015**. This places a statutory duty on public bodies in Wales to consider sustainable development in their decision-making. Whilst sustainability has been at the heart of PPW since it was first published in 2002, the concept has been expanded so that it now incorporates, more explicitly, cultural heritage and well-being.

1.5 ***Sustainable Development*** (in Wales) is now defined, by the 2015 Act, as meaning: *"the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals".*

1.6 This is linked to the more traditional definition by the explanation that: "*Acting in accordance with the sustainable development principle means that a body must act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs".*

Figure 1.1: The Distribution of Local Planning Authorities (LPAs) between the two Regional Aggregate Working Parties (RAWPs) in Wales



1.7 The 2015 Act requires public bodies to set out plans as to how they will take decisions in order to meet seven well-being goals that are set out in law. These relate to ***prosperity***, ***resilience***, ***health***, ***equality***, ***community cohesion***, ***vibrant culture*** (including a thriving Welsh language) and ***global responsibility***.

1.8 The Act also outlines five ways of working which authorities need to demonstrate they have carried out in undertaking their sustainable development duty. These require consideration to be given to ***long term*** visions; the ***prevention*** of adverse impacts; the ***integration*** of policies to promote balanced decision-making; ***collaboration*** between public bodies and the private and third sectors; and the built-in ***involvement*** of the public and stakeholders in the planning system through statutory consultation and engagement. The Regional Technical Statements have always reflected all five of these ways of working, with the concepts of policy integration and collaborative working being enhanced further still in this Review.

1.9 In 2018, the Welsh Government updated **Planning Policy Wales** to assist in the delivery of the new act through the planning system. The latest version (Edition 10) was published in December 2018. This introduced five new Key Planning Principles linked variously to the five ways of working. One of these: ***Making the Best Use of Resources***, is clearly of direct relevance to mineral planning and thus to the Regional Technical Statements. This principle is explicitly linked, in PPW, to the concept of maintaining a 'long-term' vision with regard to climate change, decarbonisation and the circular economy. The Proximity Principle, which plays an important role in the RTS methodology, is highlighted as a means of ensuring that problems are solved locally rather than passing them on to other places or future generations, and so that the use of land and other resources are sustainable in the long term.

1.10 The fifth key planning principle: ***Maximising Environmental Protection and Limiting Environmental Impact*** is also of direct relevance. This refers explicitly to the need for respecting environmental limits (thereby supporting the notion of Environmental Capacity as used within the RTS). It also highlights the importance of the precautionary principle in ensuring that cost-effective measures to prevent possibly serious environmental damage are not postponed just because of uncertainty regarding the seriousness of potential risks. Whilst this is not explicitly part of the RTS process, it may nevertheless have a bearing on the spatial planning of future allocations.

1.11 Specific **minerals planning policies** are now incorporated within PPW (in paragraphs 5.14.1 to 5.14.57), rather than being in the separate Minerals Planning Policy Wales document, as had previously been the case (before 2016). Although the sequence and structure of these policies has been modified, not least to embrace certain aspects of the cultural environment now included within the definition of sustainable development, there are no significant changes in policy requirements that have a bearing on the present Review.

1.12 In this regard it is worth noting that one change, which had been introduced in versions 8 and 9 of PPW, has been reversed in the latest edition. This relates to the treatment of Sites of Special Scientific Interest (SSSIs) and National Nature Reserves

(NNRs). In versions 8 and 9 of PPW, these areas were included, along with National Parks and Areas of Outstanding Natural Beauty, as locations where minerals development should not take place, save in exceptional circumstances (whereas previously, in MPPW, that had not been the case). Version 10 has reversed that change, so that SSSIs and NNRs are now included (along with SPAs, SACs and Ramsar sites) within para. 5.14.37, where the requirement is for proposals to be 'carefully examined', rather than in para. 5.14.35, which retains the 'exceptional circumstances' test. Had this not been reversed, it would have had major implications on the allocation of sites for future working – significantly reducing the scope for finding such sites in areas where the available geological resources are highly constrained.

1.13 Overall, the new PPW changes nothing with regard to the RTS process, other than reinforcing the principles which are already enshrined within it.

1.14 **The Environment (Wales) Act 2016** introduced the Sustainable Management of Natural Resources (SNMR) and set out a framework to achieve this as part decision-making. The main objective is to maintain and enhance the resilience of ecosystems and the benefits they provide.

1.15 The Act requires the Welsh Government to prepare, publish and implement a statutory **Natural Resources Policy** (NRP) setting out its priorities in relation to the sustainable management of natural resources, while Natural Resources Wales (NRW) is required to produce a '***State of Natural Resources Report***' and to prepare '***Area Statements***' to inform place-based action.

1.16 The NRP sets out three National Priorities, linked directly to achieving goals within the Well-being of Future Generations (Wales) Act. These are: ***delivering nature-based solutions***; ***increasing renewable energy and resource efficiency***; and ***taking a place-based approach***.

1.17 The first of these focuses on maintaining and enhancing the ecosystem services derived from natural resources. As well as the more obvious biodiversity-related resources, these include services associated with both mineral extraction and the restoration of former mineral workings. Though not mentioned in the NRP, these are examined in detail in reports for Natural England and Defra on an ecosystems approach to long-term mineral planning in the Mendip Hills (Thompson & Birch 2009; Thompson *et al.* 2010). Ecosystem services have an important bearing on site-specific aspects of mineral development, though probably not at the more strategic regional level being considered within the RTS.

1.18 Minerals are more explicitly noted in relation to the second priority (resource efficiency), both in relation to the promotion of recycled and secondary aggregates and the optimal utilisation of primary aggregates. These imperatives are already enshrined within the minerals policies of PPW, however, and are therefore fully incorporated in the methodology for producing apportionments within the RTS.

1.19 The third priority – taking a place-based approach – can also be very applicable to mineral development (e.g. through community involvement in planning decisions and restoration proposals). By definition, however, this again is a site-specific issue and is not something which can be addressed at the wider strategic level of the RTS.

1.20 It is concluded that, as with the Well-being of Future Generations (Wales) Act 2015 and the revision of PPW, the Environment (Wales) Act 2016 appears to reinforce the principles already enshrined within the RTS process, without imposing any new or different requirements.

1.21 In line with those requirements, ***the overarching objective in planning for aggregates provision***, as set out in paragraph 7 of MTAN1 is "*to ensure supply is managed in a sustainable way so that the best balance between environmental, economic and social considerations is struck, while making sure that the environmental and amenity impacts of any necessary extraction are kept to a level that avoids causing demonstrable harm to interests of acknowledged importance*".

1.22 Subsidiary objectives in paragraph 29 of MTAN1, which relate to delivering a more sustainable pattern of supply include:

- examining very carefully existing (permitted) reserves on a national and regional basis to see if they are adequate in the short, medium and long term;
- only granting permission for future extraction to take place in the most environmentally acceptable locations, in accord with development plans that are informed by the Regional Technical Statement which in turn is based on the environmental capacity assessment;
- actively reducing the proportion of primary aggregates used in relation to secondary, recycled or waste materials;
- minimising the transportation of aggregates by road;
- seeking self-sufficiency within regions, thereby avoiding the need to transfer the environmental costs of aggregates extraction to other areas; and
- careful and continual assessment of existing and anticipated future exports of aggregates to areas outside Wales (in consultation with those importing regions outside Wales) to determine whether that supply is the best environmental and practicable option for all.

The Scope and Purpose of RTS Recommendations

1.23 Each RTS Review provides a mechanism for encouraging the national sustainability objectives relating to minerals to be met by the individual Local Planning Authorities (LPAs) within each Region over a period of up to 25 years (for crushed rock) or 22 years, in the case of land-based sand & gravel (sufficient to cover the MTAN1 requirements for maintaining minimum landbanks of 10 years and 7 years, respectively, throughout the full 15-year term of each LDP). In the case of Cardiff, which has a 20-year Plan Period, these durations are increased to 30 years (for crushed rock) and 27 years for sand & gravel.

1.24 The RTS provides specific recommendations to the constituent LPAs regarding the quantities of aggregate which need to be supplied from each area (***apportionments***) and the nature and size of any ***allocations*** which may need to be made in their Local Development Plan (LDP) to ensure that adequate provision is maintained throughout the relevant Plan Period. In this Review, the basic recommendations are set out within this document with further details being given in the Regional Appendices.

1.25 Paragraph 50 of MTAN1 specifically requires the relevant parts of the RTS strategy (principally, the RTS apportionments and allocation requirements) to be incorporated into individual LDPs. In the present Review, however, apportionment figures are also identified for sub-regional groupings of LPAs and, in some cases, the requirements for individual LPAs within those areas are identified only as ***indicative*** figures, subject to more detailed investigation by the LPAs involved and to industry responses to future calls for sites. Further details of the sub-regional groupings and the apportionment methodology are set out in Chapter Five of this Review.

1.26 In all cases, however, it must be emphasised that the RTS recommendations are intended to be of a **strategic** nature. The documents are not intended to provide site-specific information or guidance. It is for the individual LPAs to determine how the strategic requirements identified in the new RTS should be met within their areas. This includes identifying allocations (where these are required by the RTS or, in some cases, by other local factors), and setting out corresponding policies within their LDPs to guide the Development Management process for future mineral extraction.

1.27 Moreover, where it is justified by new (e.g. more up to date, more detailed or more precise) evidence, it is open for individual LPAs to depart from the apportionment and allocation figures recommended by the RTS when preparing their LDP policies. In doing so, however, an LPA would need to demonstrate that their intended departure would not undermine the overall strategy provided by the RTS itself (e.g. by working together with other LPAs within the same sub-region to ensure that sub-regional and regional totals are still achieved). To reinforce that concept, this Review of the RTS introduces a new requirement for all LPAs within each sub-region to agree a Sub-Regional Statement of Collaboration, and for this to be approved by the RAWP, prior to the Examination of any individual LDP within that area.

1.28 MTAN 1, paragraph A3, notes that "*If the local authorities reach no agreement or if individual local authorities do not accept the Regional Technical Statement, the Welsh Assembly Government will consider its default powers to intervene in the planning process as a last resort*".

1.29 For each Region, Sub-region and individual LPA, the RTS recommendations are informed by the analysis of:

- available resources, permitted reserves, sales and landbanks of primary land-won aggregates;
- the availability and supply of marine, secondary and recycled materials;

- levels of demand upon the region for the supply of aggregates, including exports;
- levels of imports of aggregate into the region;
- the proximity principle, in relation to the transportation of aggregates; and
- the environmental capacity of areas to accept the impacts of future quarrying

1.30 Further details of the key principles and approaches used within this analysis are set out in the next chapter.

Aims and Objectives of the RTS 2nd Review

1.31 The Welsh Government's **aims** of the 2nd Review have been:

(i) to confirm or refine the existing methodology and update the current data/information inputs of the current RTS documents; and

(ii) to prepare new apportionments and an updated RTS for each RAWP region

1.32 These are precisely the same as the aims for the 1st Review.

1.33 The **guiding principles** for the review (changed only very slightly from those relating to the 1st Review) were identified by Welsh Government as follows:

(i) The RTS will be reviewed at 5-year intervals, in line with policy, with a second review to be completed in 2019. The plan period for each RTS will be 25/22 years;

(ii) To utilise data for the latest year for which information is available as baseline information for the purposes of the review;

(iii) To have regard to recent research which may identify any issues that need to be covered in the review;

(iv) The review itself needs to be transparent, engage appropriate stakeholders but recognise that the exercise is largely technical and aimed at providing information and evidence to be utilised in planning processes and therefore consultation and governance should be proportionate,

(v) The review will result in an updated statement for each region which is clear, concise and user friendly;

(vi) Recognise that WG is supportive of collaboration between authorities in negotiating how need, as represented by RTS apportionments, is met, if appropriate;

(vii) The reviews will not start from scratch but will build on the current RTS documents.

1.34 In order to consider what further adjustments might be needed to the guiding principles and/or the methodology to be used, an RTS Technical Group was convened by the South Wales and North Wales RAWPs. Following internal

consultation among RAWP members, the Group's final recommendations were as follows:

1) The ***base year*** for calculation of the apportionment and allocations should be the date of the latest year for which information is available;

2) The RTS 2nd Review should calculate the ***3-year average*** annual production figure and the ***10-year average*** annual production figure and use the higher of the two figures as the basis for apportionment calculations;

3) There should not be a separate landbank for ***high PSV rock*** but there should be a narrative included in the RTS setting out the considerations to be undertaken if high PSV rock is part of the crushed rock landbank in a particular MPA area;

4) Regarding the question of whether ***regional groupings of LPAs*** should be used for the calculation of landbanks, the Technical Group supported this in principle but considered that identifying appropriate regional groupings should be a task undertaken by an independent Consultant as part of the RTS Review process. The Consultant should also consider whether apportionment should be for a regional area only or whether this should be broken down to each LPA area;

5) Regarding the treatment of ***ongoing quarrying activity within National Parks***, the Group considered that the position is adequately covered in National Policy. There should therefore be no change to the way in which production within National Parks is monitored and reported. This question specifically relates to current production. It does not relate to landbanks for National Parks as they are subject to the 'exceptional circumstances' test;

6) Regarding the issue of ***maintaining production capacity*** within a particular area, the Group resolved that the consultant appointed to produce the RTS should be asked to consider this for each LPA or region and to identify where there is a danger of under provision within the lifetime of the RTS 2nd Review, even though the apportionment figure may be met arithmetically.

1.35 Concern was also expressed by the Technical Group about the ***potential impact of major projects*** on landbanks and the ability of the quarrying industry in Wales to respond to these potential spikes in demand. It therefore advised that one of the considerations to be addressed in carrying out the 2nd Review is whether the apportionment calculations for each LPA or region need to be adjusted to reflect these major 'spikes' in demand and, if so, how that could be done.

1.36 The first of these recommendations is now embedded within the Guiding Principles note above. The second, third and fifth recommendations are also regarded as settled matters and form part of the methodology for the determination of apportionments and allocations within the 2nd Review. The fourth and sixth recommendations, together with the additional concern regarding major projects, noted above, were discussed at a series of Stakeholder meetings in Stage 1 of the Review, and are incorporated in the adopted methodology.

1.37 Whether or not ***Strategic Environmental Assessment*** (SEA) should be undertaken was considered as part of the original development of the Regional Technical Statements. It was felt, however that, as the RTS documents primarily represent a collaboratively prepared evidence base and are neither required nor constitute a plan or programme for the purposes of the SEA Directive, such an assessment was not necessary. As with the original RTS documents and the First Review, therefore, at this broad level, and given the further detailed analysis and Plan-making that will be required to implement the RTS through Local Development Plans (where SEA is a formal requirement), it was not considered appropriate or required that SEA should be conducted as part of the Second Review.

1.38 Several of the terms used above (e.g. apportionments, allocations, landbanks, permitted reserves and resources) have very specific meanings with respect to minerals planning, which need to be understood. These are all defined in the ***Glossary of Terms*** at the back of this report. Similarly, a number of commonly-used abbreviations, although explained in the text where they are first introduced, are summarised in the list which follows the glossary.

2. Key Principles

The RTS Approach

2.1 A key principle which underpins the overall approach within the RTS and MTAN1 is the need to move away from the old, demand-led system of '***Predict and Provide***' to the more modern concept of '***Plan, Monitor and Manage***'. These terms originated in relation to the planning for housing provision but can also be applied to minerals.

2.2 It is important to recognise, however, that the Plan, Monitor and Manage system still depends, crucially, on an assessment of demand. At the heart of MTAN1 is the aspiration that, once a reasonable estimate of demand has been obtained, any subsequent fluctuations above that level should be accommodated by increased supplies from secondary and recycled sources (see glossary for definitions), rather than being seen as a justification for granting new planning permissions for primary aggregate extraction. Whilst that aspiration is widely supported, there is evidence to suggest that the percentage contribution available from secondary and recycled sources, having risen from around 10% of the total aggregates market in the 1990s to around 28% during the last decade (as a direct result of financial incentives and promotional work to increase acceptability) is now likely to have peaked. As a consequence of this, the future use of recycled/secondary materials is likely to depend mainly on the level of future construction output (since the availability of recycled materials is closely dependent on rates of new construction). It is therefore perhaps more reasonable to assume that secondary and recycled aggregates will continue to provide a high proportion of total aggregate production but will not be able to be relied upon to fulfil any future peaks in demand on their own: there may also need to be increased contributions from primary aggregate sources.

2.3 The RTS process supports this approach by investigating the likely continued availability of secondary and recycled aggregates from all available sources within each area, and factoring this in to an assessment of the residual demand for land-won primary aggregates, as informed primarily by historical sales data and the consideration of planned future construction activity. That residual level of demand is then translated into ***apportionments*** for each local authority, subject to the consideration of other sustainability issues including proximity and environmental capacity (see below).

2.4 An important tool in the ongoing management of the supply of aggregates is the monitoring of ***landbanks***. A landbank, as defined in paragraph 45 of MTAN1, is the stock of planning permissions for the winning and working of minerals at *active* and *inactive* sites[2], at any given point in time and for a given area. Where there is an insufficient landbank of permitted reserves in a particular area to meet the identified demand, over a sustained period of time, the RTS recommends the need for ***allocations*** for future working to be identified in LDPs. Provided that the

[2] Detailed definitions of active, inactive, dormant and suspended sites are given in the **Glossary of Terms** at the back of this report, as are the full definitions of resources, permitted reserves, apportionments, landbanks, allocations and provision.

reserves at *dormant* sites have not already been included in the landbank calculations[3], and where a Local Planning Authority considers that such reserves are likely to be capable of being worked within the relevant period (subject to the agreement of modern conditions) it is suggested here that these may be offset against the requirement for new allocations. The same logic applies to sites where permission has been *suspended*, following a stalled IDO or ROMP review (see **Glossary** for full explanations of these various terms).

2.5 Thereafter, by virtue of the Plan-led approach, additional applications for new permitted reserves are unlikely to be granted except within allocated sites or areas, unless there are compelling reasons why fluctuations in demand cannot be met from those locations or from alternative (secondary and recycled) sources. The situation is monitored annually by the RAWPs and managed, as required, through periodic (5-yearly) revisions of the Regional Technical Statements.

2.6 In terms of its overall approach, the RTS concept represents an important modification of the more general Managed Aggregate Supply System (MASS) which had previously operated across both England & Wales for many years. The main difference is that the Welsh system explicitly seeks to incorporate two key principles of sustainability with respect to aggregates supply: the ***proximity principle*** and the notion of ***environmental capacity***, as explained below.

The Proximity Principle

2.7 This relates simply to the objective of minimising unnecessary transportation of bulk materials, particularly by road, by ensuring that sources of supply (e.g. aggregate quarries) are located as closely as possible to the main centres of demand (primarily centres of population and major infrastructure projects). The minerals planning system has only limited controls on this: it cannot dictate where aggregates are supplied to, from any given source, and it cannot dictate where suitable sources exist (since minerals can only be worked where they are found). The planning system can, however, provide strong guidance in terms of where planning permissions are likely to be given for new quarries (or extensions to existing quarries) within areas of suitable geology, and it can take account of transportation factors in deciding where these ought to be. In the long term the RTS process has a key role to play in this, by gradually modifying the overall pattern of supply, where this is needed.

2.8 The proximity principle needs to be modified, in some cases, by recognition that certain types of 'high specification aggregate' (HSA) serve quite different markets and are therefore required for distribution over much greater distances. This applies especially to the skid-resistant aggregates derived from the Pennant Sandstones of South Wales and from a range of other formations within Powys and elsewhere, which are essential for road surfacing applications throughout England and Wales (Thompson, Greig & Shaw, 1993; Thompson *et al*., 2004). Indigenous sources of HSA

[3] There are differences of interpretation (of MTAN1 guidance) regarding whether or not the permitted reserves at dormant sites should be included in landbank calculations that are used for the purpose of assessing the need, or otherwise, for new allocations. As explained in the **Glossary**, for the purposes of this review, such reserves, and those at suspended sites, have been excluded.

materials within England are very limited, and many are constrained by their location within National Parks. HSA exports from Wales are therefore of major significance. Separate consideration also needs to be given to the issue of high purity limestone production for use as a metallurgical flux, for chemical production and for the manufacture of cement. Whilst these are all non-aggregate end-uses, they are frequently produced from the same geological resources as crushed rock aggregates, but the quarry locations may be determined or justified primarily by the requirements for the higher value industrial products.

2.9 The proximity principle is further modified by the requirement in MTAN 1 (paragraph 49) that landbanks do not need to be maintained, and that there should therefore be no future allocations, within National Parks or Areas of Outstanding Natural Beauty (AONBs). This is in line with Planning Policy Wales, which states (at para. 5.14.35) that mineral extraction should not take place in National Parks and AONBs, except in very exceptional circumstances.

2.10 The original Regional Technical Statements aimed to reflect the Proximity Principle by providing 'per capita' apportionments for future aggregate provision (i.e. proportionate to the population within a given LPA area, as a surrogate for the likely distribution of demand). Major drawbacks of this approach, however, were found to be the lack of correlation between existing population figures and either the demand for, or availability of, aggregate supplies.

2.11 In the 1st Review of the RTSs, general consideration was given, instead, to variations in *population density*, but account was also taken of a range of other influences, including access routes and transport distances, which neither population nor population density figures are able to reflect. That analysis was, necessarily, of a qualitative nature because of the complexities involved, and to avoid the spurious precision associated with inappropriate quantitative analysis. It allowed the Proximity Principle to be acknowledged but relied primarily on historical sales figures as indicators of demand. This recognised that the demand for supplies from a particular quarry must inevitably be influenced (very strongly) by transport distances, since these constitute a major element of the delivered price. Local sources of supply will therefore always be preferred to those from more distant locations, provided that the material supplied is fit for purpose. Equally, more remote sources would only maintain their commercial viability if they are capable of supplying aggregates of a type that are in high demand but not available from sources located nearer to the markets.

2.12 The main criticism of that approach has been that reliance on historical sales figures inevitably perpetuates the historical pattern of supply, giving very limited scope for this to be changed, over time, to achieve any improvement in sustainability. In the present Review, an attempt has therefore been made to use recent data on housing completions and planned future housing provision, both as part of the overall assessment of future demand, and to influence the sub-regional apportionment of future aggregates provision. This is explained more fully in Chapter 3.

Environmental Capacity

2.13 By comparison, the notion of environmental capacity has always been a more controversial issue. The basic principle is clear enough: i.e. that quarrying should be focused, as far as possible, on areas which have the greatest capacity to 'absorb' the environmental impacts that are (or may be) associated with quarrying activity, and thus to contribute to future supply with a minimum of adverse impacts. The controversy derives from the lack of consensus in terms of how 'environmental capacity' should be defined, and from the way in which this has influenced the allocation targets within the Regional Technical Statements.

2.14 In Wales, two previous research projects provided the evidence base for the system that is currently used: **EMAADS** (Establishing a Methodology for Assessing Aggregates Demand and Supply - Arup, 2004) and **IMAECA** (Implementing the Methodology for Assessing the Environmental Capacity for primary Aggregates - Enviros, 2005). These projects resulted in a set of 'traffic light' maps (as they are often referred to) being issued to each LPA within Wales to indicate areas of *relatively* high (green), medium (amber) and *relatively* low (red) environmental capacity. The thresholds between these categories were arbitrarily set, but the differentiation between them does at least provide a starting point for the consideration of environmental capacity and thereby enables nationally consistent *strategic* decisions to be made, by the RAWPs, with respect to future aggregates provision.

2.15 The colours shown on these maps reflect combined scores from the assessment of twelve different 'national environmental indicators' for each square kilometre. These comprised:

(i) Settlements
(ii) Roads
(iii) Land Use
(iv) SSSIs
(v) Heritage
(vi) Public Enjoyment
(vii) Landscape
(viii) Local Landscape
(ix) Watercourses
(x) Spheres of Influence
(xi) Existing Workings
(xii) Cumulative Effects

2.16 It is important to understand that the IMAECA tool was designed to be used *only* to inform the Regional Technical Statements and explicitly *not* to be used directly in Local Development Plans, Development Management processes and decisions or planning appeal decisions.

2.17 The consideration of Environmental Capacity at this strategic level deliberately avoids the direct use of more detailed 'primary' environmental information such as the locations of individual designations (other than National Parks and AONBs). Once again, this is to avoid being site-specific and to avoid prejudging issues which need to be addressed in more detail through LDP and Development Management processes at a local level - either within individual local authorities and/or through joint working between neighbouring authorities. Joint consideration of the relationship between mineral resources and environmental designations on a sub-regional basis would potentially allow more detailed consideration to be given to these important issues at a spatial scale which extends beyond the boundaries of an individual local authority. This could tie-in well with the Area-Based Natural Resource Management Approach being promoted by Welsh Government through the **Environment (Wales) Act 2016**.

2.18 However, despite this information being available, and being described for each LPA within the original RTSs, the environmental capacity results from the IMAECA study had no influence at all on setting the apportionment figures within those reports. That may partially have been due to concerns about not prejudging matters that should properly fall to be dealt with through the Local Development Plan process. This certainly applies to any site-specific judgements but, at a more strategic level, there is both scope and wide support for environmental capacity data to inform and potentially influence the bigger picture.

Changing the Pattern of Supply

2.19 Important consideration also needs to be given to existing patterns of supply. MTAN 1 suggests that these patterns are largely a historical residual and '…*will need to gradually change to reflect current notions of sustainability'*. That may, or may not be the case, however, since the historical supply patterns already have much to commend them: they reflect the ***spatial distribution of available resources*** (which is of fundamental importance, since minerals can only be worked where they are found) and the ***economic imperative*** of industry to establish quarries as close as possible to areas of demand (in order to minimise transport costs), subject to a range of environmental designations, planning policies and other constraints. Over many decades, quarries which have become uneconomic because of changing demand or outdated transport networks and rising costs have naturally fallen into disuse. Those which remain are generally (though not always) well-placed to serve the current markets although some remain in conflict with designations, environmental concerns or neighbouring land uses which, in many cases, post-date the mineral planning permissions involved. Where this is the case then, unless there are no sensible alternatives in terms of the availability of resources, it may not be appropriate for the historical supply pattern from a given area to be used as a proxy for future supply from that area.

2.20 Together, the implementation of the proximity principle and the notion of environmental capacity, as described above, may gradually induce changes to the existing patterns of supply. But this would only be justified if it is found that, once all aspects of sustainability are taken into account, alternative patterns are seen to

have clear advantages over those which currently exist. Even where changes are clearly justified, these cannot generally be immediately implemented, since (unless Prohibition Orders are issued) existing quarries will be able to continue until their existing planning permissions expire and/or until they run out of permitted reserves.

2.21 Nevertheless, the RTS can help to influence future changes in supply pattern, where this is found to be desirable, by adjusting the apportionments given to individual LPAs. This, in turn, will then help to focus new allocations in the areas required, and should eventually result in a shift towards a more sustainable pattern of supply. Chapter 4 of this report presents an overview of the existing supply pattern, highlighting the need for limited adjustments in certain areas, drawing on the more detailed analyses presented in the two Regional Appendices (A and B).

3. Methodology for the 2nd Review of the RTS

Introduction

3.1 In the original and First Review of the Regional Technical Statements, the starting point for the apportionment of future aggregates provision[4] was to make an assessment of the likely future demand. However, in contrast with the former guidelines for aggregate provision issued for both England and Wales, prior to devolution, the RTS process has always avoided any attempt to make detailed forecasts of future demand based on econometric modelling. In the past, these had been found to be unreliable and were criticised for their lack of transparency. Instead, a series of alternative approaches have been used in Wales and each 5-yearly review of the RTS provides opportunities for further refinement.

3.2 The methodology used in the previous (First) Review, in 2014, had been based primarily on historical sales averages, combined with an assessment of the various 'drivers' of potential future change – much like the methodology for producing Local Aggregate Assessments in England, but carried out at a national scale. For the present Review, this has been combined with an attempt to reflect ***planned*** future requirements for construction activity (particularly housing)[5], and to avoid perpetuating historical supply patterns in areas where there is scope to encourage more sustainable patterns of supply.

3.3 Given the importance of the Plan-led system, there is a need for joined-up thinking between planned construction activity and the planned provision of associated construction materials. This resonates strongly with the integration of policies to promote balanced decision-making: one of the five key ways of working identified in the Well-being of Future Generations (Wales) Act 2015. The concept applies irrespective of whether the planned construction (e.g. housing or major infrastructure projects) materialises. If the planned activity *does* take place, then it will not be hampered by a shortage of materials; if it does not, then there will have been an over-provision of aggregates, but that would not equate to excess production (since aggregates will only be quarried as and when the demand occurs).

Preliminary Research

3.4 In developing the methodology to be applied in the 2nd Review, it was first necessary to undertake some preliminary analysis of the source data. This is briefly outlined below under five headings: historical sales data, housing data, economic forecasts, availability of alternative materials and the balance between imports and exports.

[4] This analysis relates only to the requirements for primary, land-won aggregates. As noted in the original RTS documents, targets for the production of alternative aggregates (i.e. secondary aggregates, recycled materials and marine-dredged aggregates) have traditionally been 'top-sliced', leaving a residual demand for land-won primary aggregates. As with the First Review, it was agreed with the Steering Group that the proportion of total aggregates supply provided from secondary and recycled aggregate sources would remain approximately constant, with the actual quantities rising and falling in relation to overall levels of economic activity.

[5] Although planned housing construction may be no more reliable, as an indicator of future demand, than the former aggregate guidelines were, the justification for using such figures is different: it is not an attempt to predict demand, only to ensure consistency in the planning process and to give tangible recognition to the link between construction and aggregates.

Historical Sales Data

3.5 The Annual Reports of the South Wales and North Wales Regional Aggregate Working Parties provide an important source of data regarding annual sales and annual updates to the stock of permitted reserves of land-won primary aggregates. They also provide information on secondary aggregates and on landings of marine-dredged aggregates.

3.6 The published reports for South Wales currently provide data up to the end of 2016. Those for North Wales provide data up to 2015 but, for the purpose of this Review, the previously published figures have been refined and updated (to include 2016), by the RAWP secretary. The resulting annual totals for the period 2007 to 2016 are presented in Table 3.1, below. This represents the main 'baseline' period for use in the Second Review. All figures are given in millions of tonnes (mt).

Table 3.1: Annual Sales of Land-won Primary Aggregate in North Wales and South Wales, from RAWP reports.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
North Wales Crushed Rock (mt)	6.298	6.225	3.674	4.381	4.348	3.938	4.052	4.626	5.003	5.023
North Wales Land-won Sand & Gravel (mt)	1.063	0.711	0.599	0.664	0.641	0.588	0.529	0.892	0.940	0.726
NW Total (mt)	**7.361**	**6.936**	**4.273**	**5.045**	**4.989**	**4.526**	**4.581**	**5.518**	**5.943**	**5.749**
South Wales Crushed Rock (mt)	12.51	10.35	8.13	7.20	7.73	7.39	7.55	7.87	8.31	8.41
South Wales Land-won Sand & Gravel (mt)	0.24	0.03	0.14	0.12	0.11	0.27	0.28	0.20	0.27	0.16
SW Total (mt)	**12.75**	**10.38**	**8.28**	**7.32**	**7.84**	**7.66**	**7.83**	**8.07**	**8.58**	**8.57**
Wales Total (mt)	**20.11**	**17.32**	**12.54**	**12.37**	**12.83**	**12.19**	**12.41**	**13.59**	**14.52**	**14.32**
NW/SW Split (%)	37/63	40/60	34/66	41/59	39/61	37/63	37/63	40/60	41/59	40/60

SOURCE: Annual RAWP reports, updated (for North Wales) by the RAWP Secretary, for the purposes of this review[6].

3.7 It is important to remember that the historical sales figures represent only the *residual demand* for land-won primary aggregates, since the overall demand over this period was also satisfied, to varying degrees, by supplies from secondary, recycled and marine aggregate sources, as well as by small amounts of imports from primary aggregate sources in England. By default, therefore, using historical sales data as part of the basis for estimating future demand assumes that the supply of secondary, recycled, marine and imported aggregates will continue as before (with different levels of contribution from each source in each of the various LPAs).

[6] Whilst the data presented in Table 3.1 are useful in showing the year-to-year variations, the totals are slightly different from those presented an all subsequent tables in this report, which were derived from new, and more accurate figures collated by both RAWP secretaries for the specific purpose of this review.

3.8 In the First Review, historical sales data were represented by the average sales over the preceding 10-year baseline period. For the present Review, it was decided that consideration should also be given to average sales over the most recent 3-year period (2014 to 2016), in recognition of the fact that for some areas (notably Cardiff, and the three main 'exporting' LPAs of Flintshire, Wrexham and Powys), there has been a sharp increase in recent production. The RTS Steering Group's view was that the highest of the 10-year and 3-year averages, for each LPA, should be used in calculating a more representative National total. Table 3.2, below, presents the figures for each LPA and the derived total. The LPAs are listed simply in alphabetical. Their geographical distribution and arrangement into the North Wales and South Wales RAWP areas, are shown in Figure 1.1, above.

Table 3.2: 10-year and 3-year Total Land-Won Primary Aggregates Sales Averages (to 2016) for each LPA.

Unitary Authority	**10-yr Average Aggregate Sales (total)** (mtpa)	**3-yr Average Aggregate Sales (total)** (mtpa)	**Highest of 3-yr and 10-yr ave. sales in each LPA** (mtpa)
Blaenau Gwent	0.170	0.180	0.180
Brecon Beacons National Park	0.490	0.540	0.540
Bridgend	0.580	0.600	0.600
Caerphilly	0.390	0.100	0.390
Cardiff	0.830	1.060	1.060
Carmarthenshire	0.832	0.821	0.832
Ceredigion	0.300	0.240	0.300
Conwy + Snowdonia NP	0.955	0.813	0.955
Denbighshire	0.329	0.043	0.329
Flintshire	2.663	3.204	3.204
Gwynedd	0.868	0.898	0.898
Isle of Anglesey	0.236	0.255	0.255
Merthyr Tydfil	0.150	0.010	0.150
Monmouthshire	0.070	0.060	0.070
Neath Port Talbot	0.460	0.300	0.460
Newport	0.000	0.000	0.000
Pembrokeshire	0.510	0.360	0.510
Pembrokeshire Coast NP	0.330	0.270	0.330
Powys	2.470	2.650	2.650
Rhonda Cynon Taf	0.610	0.670	0.670
Swansea	0.000	0.000	0.000
Torfaen	0.000	0.000	0.000
Vale of Glamorgan	0.660	0.580	0.660
Wrexham	0.435	0.514	0.514
TOTAL, Wales			**15.557**

(SOURCE: RAWP Secretaries, 2018)

3.9 This National total of 15.557mt compares with an equivalent figure of 17.69 mt for the First Review (based on the 10-year average, only, for the period 2001 to 2010).

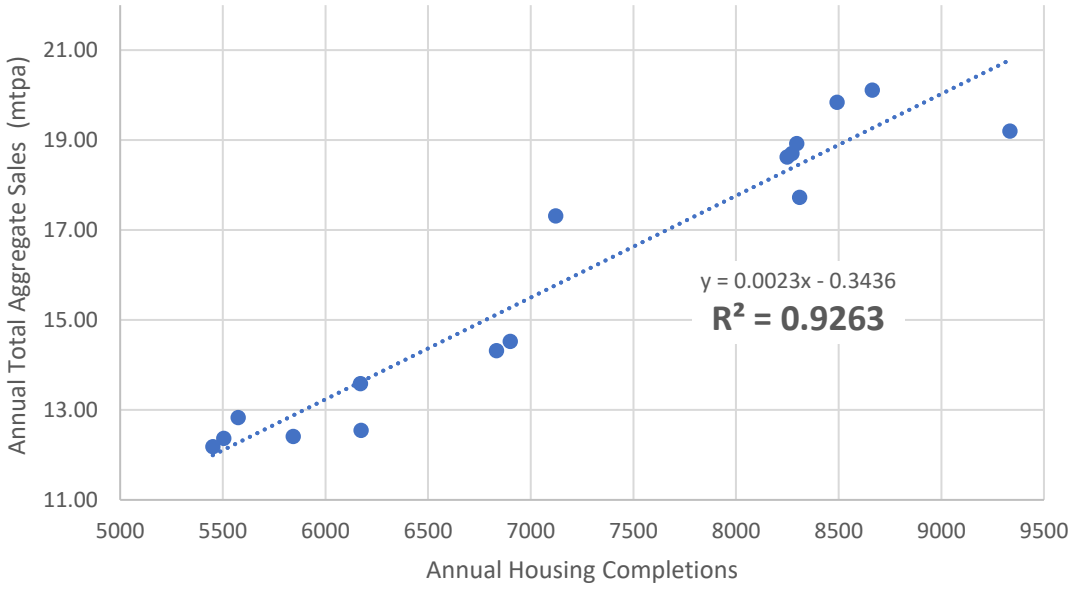
This marked reduction reflects the fact that the baseline for the present Review includes the whole of the recent economic recession, whereas the previous baseline period incorporated only part of the recession together with a preceding period of significantly higher sales.

Housing Data

3.10 Statistics on housing completions (and housing starts) for each LPA in Wales are reported on the Welsh Government's 'StatsWales' website[7]. The data are reported in financial, rather than calendar years, so are not directly compatible with aggregate sales data, but comparisons over time can nevertheless reveal important trends. In doing so, two particular findings clearly emerged.

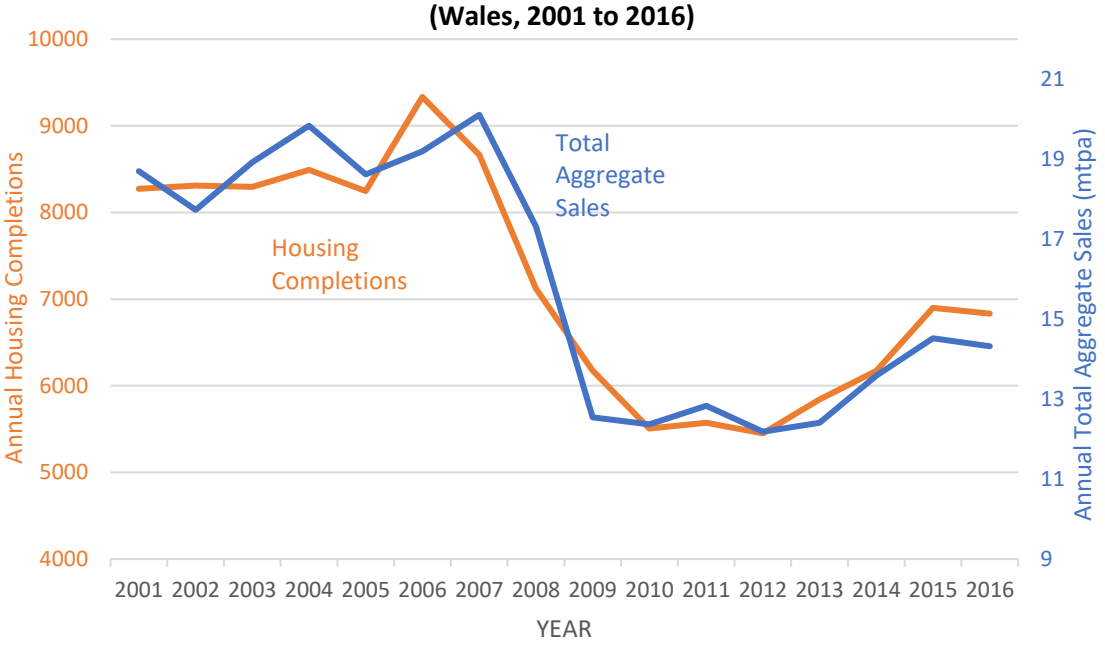
3.11 Firstly, an extremely high degree of correlation was revealed, at a national level, between annual house completions and annual sales of aggregates, with a correlation coefficient (R^2) of 0.9236. This is illustrated in Figure 3.1 below. The two time series are compared in Figure 3.2, demonstrating their very close similarity of responses to the recent sharp recession and subsequent faltering recovery.

Figure 3.1: Correlation of Total Aggregate Sales with Annual House Completions (Wales, 2001 - 2016)



[7] https://statswales.gov.wales/Catalogue/Housing/New-House-Building/newdwellingscompleted-by-area-dwellingtype-numberofbedrooms

Figure 3.2: Annual Aggregate Sales and Housing Completions Time Series (Wales, 2001 to 2016)



3.12 In considering the correlation shown in these diagrams, it is important to note that, whilst there is obviously a causal link between house building and aggregate consumption, the apparent strength of that correlation may be at least partly explained by the fact that both factors are governed by a separate, completely independent variable – that of economic growth.

3.13 It must also be recognised that housing accounts, directly, for only a proportion of aggregate sales. A projection of future housing growth (or decline), however reliable, could not be used with any confidence to predict the exact growth or decline of aggregate sales (only the proportion of those sales which are directly associated with house construction).

3.14 Similar analyses at regional and sub-regional levels were attempted but produced much weaker correlations – particularly in areas where a significant proportion of demand is associated with exports to England, rather than with domestic construction activity (as is the case in north-east Wales, for example, and in Powys).

3.15 The second observation relates to the comparison between annualised figures for future housing requirements[8], derived from the totals set out in adopted Local Development Plans throughout Wales, and actual housing completions data over the 10-year baseline period, as recorded by the Welsh Government. This comparison is presented in Table 3.3. below, with the LPAs again listed in alphabetical order.

[8] The data used here relates specifically to housing **requirements**, as objectively assessed for each LPA, rather than the figures for housing **provision** adopted in LDPs which are usually higher, following the inclusion of variable allowances in each LPA for 'flexibility'. The requirement figures were agreed, at a meeting of the two RAWPs, in July 2019, to be a more reliable basis for analysis.

Table 3.3: Comparison of Housing Requirements in Local Development Plans with average Annual Housing Completions in Wales (as of December 2018)

Unitary Authority	Plan Status	Plan period	Planned Future Housing Requirements	Annualised Future Housing Requirements	Average House Completions per year (2007 – 2016)
Blaenau Gwent	Adopted	2006-2021	3,500	233	99.1
Bridgend	Adopted	2006-2021	8,153	544	365
Caerphilly	Adopted	2006-2021	8,625	575	335.2
Cardiff	Adopted	2006-2026	41,415	2,071	825.3
Carmarthenshire	Adopted	2006-2021	15,197	1,013	517.8
Ceredigion	Adopted	2007-2022	6,000	400	126.1
Conwy + Snowdonia	Adopted	2007-22 & 2016-31	7,350	490	178.6
Denbighshire	Adopted	2006-2021	7,500	500	156.2
Flintshire	in progress	2015-2030	6,950	463	288.6
Gwynedd & Isle of Anglesey (Joint LDP)	Adopted	2011-2026	7,184	479	280
Merthyr Tydfil + Brecon Beacons National Park	Adopted	2006-2021 & 2007-22	4240	283	133.2
Monmouthshire	Adopted	2011-2021	4,500	300	228.6
Neath Port Talbot	Adopted	2011-2026	7,800	520	274.3
Newport	Adopted	2011-2026	10,350	690	527.5
Pembrokeshire + PCNP	Adopted	2011-2026	7,299	487	240
Powys	Adopted	2011-2026	4,500	300	191.7
Rhonda Cynon Taf	Adopted	2006-2021	14,385	959	373.9
Swansea	in progress	2010-2025	15,600	1,040	519.4
Torfaen	Adopted	2006-2021	4,700	313	174.6
Vale of Glamorgan	Adopted	2011-2026	9,460	631	284.3
Wrexham	in progress	2013-2028	7,750	517	304.2
TOTAL, Wales			**202,458**	**12,808**	**6,423.6**

3.16 It is evident from Table 3.3 that in every local authority, the levels of future housing requirements are substantially greater than recent levels of completion. For the country as a whole, the planned figures are almost exactly double the average level of annual completions.

3.17 In reality, notwithstanding the fact that the housing figures have been scrutinised in terms of their 'deliverability' as part of the Local Plan process, and should therefore be 'sound', the planned delivery of new houses will only be achieved if economic and other conditions allow. The figures are therefore not predictions and cannot be used as a basis for predicting future demand.

3.18 There is, nevertheless, a clear logic behind the notion that levels of housing requirements that are accepted for inclusion in adopted LDPs should be underpinned by a planned sufficiency of construction aggregates. As noted in para. 3.3, above, this ties-in with, and is supported by, the notion of integrating policies to promote balanced decision-making: one of the five key ways of working identified in the Well-being of Future Generations (Wales) Act 2015. **A decision was therefore made to move away from any attempt to predict future demand and to focus, instead, on making sure that future aggregates provision is reasonably matched to the planned *requirements* for housing construction**.

Economic Forecasts

3.19 Notwithstanding that decision, it is still useful to give at least some consideration to established economic forecasts, since these may have a bearing on whether or not the planned construction activity is able to be delivered.

3.20 In the First Review, it was found that there was a degree of correlation between past aggregate sales and the annual change (% growth or decline) in ***Gross Domestic Product*** (GDP), as a measure of economic activity. GDP out-turn figures are readily available (on the Eurostat website) and GDP forecasts are published regularly in the Economic and Fiscal Outlook reports from the Office of Budget Responsibility. Table 3.4, below, compares land-won aggregate sales in Wales, over each of the last 16 years (again combining data for the last review period as well as this one), against published data on the annual percentage change in GDP for the UK.

3.21 The resulting graphs (Figures 3.3 and 3.4) reveal the a relatively limited degree of correlation between the two datasets and a noticeable disconnect between the speed of recovery of aggregate sales following the recession, compared with that of GDP growth. This may be at least partly because the GDP figures are available only for the UK as a whole, and not specifically for Wales. It is concluded that these offer very limited insight regarding future aggregate requirements in Wales, and that GDP data should not be used in the assessment of future requirements for aggregates provision.

Availability of Alternative Aggregates

3.22 In considering possible trends in the demand for land-won primary aggregates, consideration needs to be given to the availability of alternative (particularly secondary and recycled but also marine) aggregate sources. Such materials are 'top sliced' in terms of policy preferences, such that only the 'residual' demand needs to be supplied from primary, land-won materials.

Table 3.4: Annual Aggregate Sales and GDP Data.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Crushed Rock * (mt)	16.97	16.18	17.46	18.30	16.95	17.75	18.81	16.58	11.8	11.58	12.08	11.33	11.6	12.5	13.31	13.43
Land-won Sand & Gravel * (mt)	1.73	1.55	1.47	1.54	1.68	1.45	1.3	0.74	0.74	0.78	0.75	0.86	0.81	1.09	1.21	0.89
Total * (mt)	**18.70**	**17.73**	**18.92**	**19.84**	**18.62**	**19.20**	**20.11**	**17.32**	**12.54**	**12.37**	**12.83**	**12.19**	**12.41**	**13.59**	**14.52**	**14.32**
GDP (UK) – Annual % change **	2.9	2.4	3.8	2.9	2.8	2.5	2.5	-0.3	-4.2	1.7	1.6	1.4	2	2.9	2.3	1.8

* SOURCE: Annual RAWP reports, updated (for North Wales) by the RAWP Secretary, for the purposes of this review.

** SOURCE: (https://ec.europa.eu/eurostat/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_nPqeVbPXRmWQ&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_pos=1&p_p_col_count=2)

Figure 3.3: Total Aggregate Sales vs GDP Annual % Change (UK), 2001 - 2016 (Correlation)

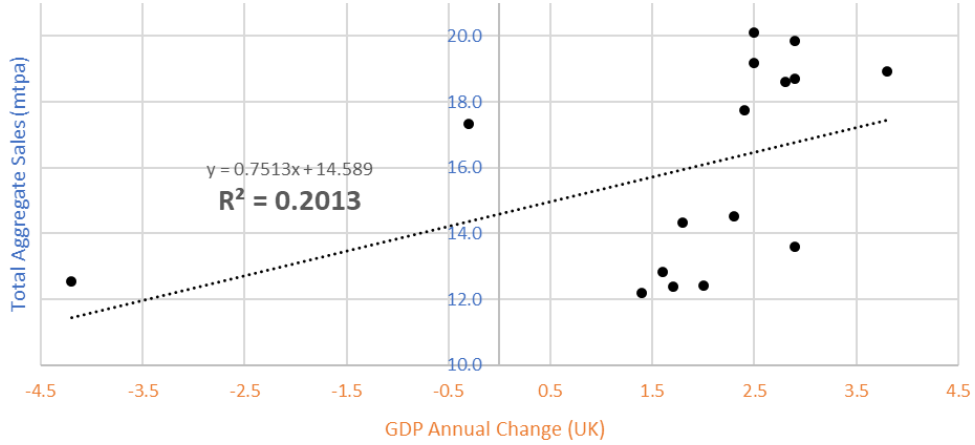
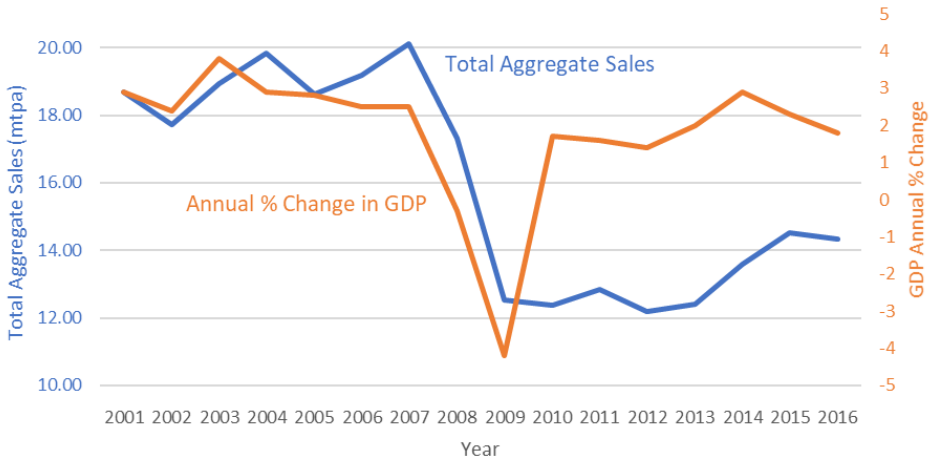


Figure 3.4: Total Aggregate Sales vs GDP Annual % Change (UK), 2001 - 2016 (time series)



Secondary Aggregates

3.23 Secondary aggregates comprise the by-products of various industrial processes, including metallurgical slags and power station arisings, but also the by-products from certain types of non-aggregate mineral extraction, such as colliery spoil and slate waste, and from the recycling of glass, ceramics, asphalt planings and rail ballast[9].

3.24 Aggregate production from metallurgical slags occurs only in South Wales. Port Talbot continues to produce both blast furnace (iron) and steel slag, whilst electric arc furnace steel slag is still produced from one site in Cardiff. The processing of older stockpiles of blast furnace slag at the former Llanwern steel works is now understood to have ceased. Secondary aggregates are produced from all of these materials although volumes are thought to be declining, with a consequent increase in the demand for primary aggregates.

3.25 Coal-fired power station arisings, comprising pulverised fuel ash (PFA) and furnace bottom ash (FBA) are currently produced only at the Aberthaw Power Station, in South Wales. With the planned closure of all coal-fired power stations by 2025, this production will cease. Whether or not historic PFA stockpiles will be able to be worked in future remains to be seen.

3.26 Small amounts of aggregate minerals (sandstone and occasionally sand) arise adventitiously from the reworking of former colliery spoil tips or from the working of opencast coal. The amounts and their suitability for use as construction aggregates are highly unpredictable, however, and quantities can vary greatly over time. Many former colliery waste tips in Wales have either been landscaped as part of reclamation schemes or utilised for base fill material. Volumes still available are very limited in North Wales but more significant in parts of the South Wales coalfield. The overall potential for producing aggregate from this material is considered to be small, for a combination of local, fiscal and regulatory reasons, but could be locally significant, particularly within Torfaen and Blaenau Gwent. Here, there may be opportunities for the material to make up for the very limited existing and potential sources of primary aggregate production, although the quality of the material and the quantities available for anything other than low grade fill, have yet to be demonstrated.

3.27 Sandstone arisings from new opencast workings have been important as 'windfall' resources at a number of sites within the South Wales coalfield, but these are classed as primary aggregates and are therefore not considered further here.

3.28 Crushed slate, derived either from slate waste (as a by-product of roofing material production) or quarried specifically for use as aggregate, features significantly in the overall pattern of supply with in North Wales (particularly in Gwynedd), but not in South Wales. Slate is included in the overall figures for crushed rock production

[9] it might appear more logical to group these recycled materials with aggregates produced from recycled construction, demolition and excavation wastes (CD&EW). However, the coverage of CD&EW is already well defined in terms of survey returns, so those items are included here as secondary aggregates.

within the North Wales RAWP reports though not in the AM Surveys. Although output fell during the recent recession, the proportions have remained high, suggesting an underlying increase in the market for slate aggregate. However, given that slate production is already included in the crushed rock statistics, this trend has no implications for the overall level of future demand for primary aggregates, only for the balance between slate and other types of crushed rock.

3.29 The various sources of secondary aggregate noted above, together with recycled aggregates, as discussed below, are currently exempt from the Aggregates Levy, in a deliberate attempt to minimise the use of primary aggregates. At the time of writing, the Aggregates Levy itself was in the process of being comprehensively reviewed by HMRC (… update to be added in due course…)

Recycled Aggregates

3.30 Aggregates produced from the recycling of construction, demolition and excavation wastes (CD&EW) form an important contribution to the overall supply of construction aggregates. The 2008 RTSs identified a total output for the whole of Wales of 3.97mt, based on 2005 survey data, and suggested a roughly 3 to 1 split between South Wales and North Wales, based on earlier surveys and population ratios. They also noted that, despite the lack of quantitative detail, it is inevitable that the greatest volumes of CD&EW arisings and usage are in the urban areas. The RTS documents emphasised, however, that all statistics for this sector need to be used with a high degree of caution, because of the low rate of response to the surveys.

3.31 The situation, in terms of available data, has not improved since the original RTSs were published. No new survey data is available, so any observations on recent or future trends can only be regarded as broad approximations. If anything, the efficiency of recycling is likely to have increased, and the introduction of WRAP's (2005) 'Quality Protocol' for the production of aggregates from inert waste may have increased the proportion and usage of higher value products derived from the various recycled sources. Such improvements, however, represent only small increments on the progress which had previously been made - primarily as a consequence of the price advantages resulting from the landfill tax and, to a lesser extent, the aggregates levy. The view of the Mineral Products Association (MPA), which is not disputed by the NRW, remains that there is little opportunity for significant further increase in the proportion of construction aggregate likely to be derived from this sector. As noted earlier, the future availability of recycled aggregates seems likely to be inextricably linked to the overall rates of construction activity and economic growth, so the safest assumption is that it will rise and fall in a very similar way to overall demand, and will thus have a neutral impact on the demand for primary aggregates, compared to the baseline period (2007 to 2016).

Marine-dredged Aggregates

3.32 Marine-dredged aggregates are of major importance in South Wales, with supplies being sourced from the Severn Estuary and the Bristol Channel, but are of very limited importance in North Wales. In south east Wales, marine-dredged material

accounted for 100% of all sand & gravel production over the baseline period (2007 to 2016), reflecting the complete lack of historical (or current) land-based sand & gravel extraction in that area, despite the existence of potential land-based resources.

3.33 For the time being, it seems reasonable to suppose that marine-dredged aggregates will continue to supply a similar proportion of overall demand as they have done over the last decade, so the demand for land-won aggregates in any of the sub-regions of either South Wales or North Wales is not likely to be affected.

Imports and Exports

3.34 The periodic Aggregate Mineral (AM) Surveys usefully include data on the distribution of aggregates from supply areas to destinations, and on the mode of transportation used. Such data is far from perfect, not least because it is only the initial destination that is recorded. In many cases this may be simply an intermediate processing and/or distribution depot, from which the products travel further. Nevertheless, it is the only available source of distribution data, and is therefore very important to the RTS process.

3.35 Table 3.5, on the following page, derived from information presented in Tables 4j and 4k of the AM Reports, reveals the extent to which aggregates produced in North Wales and South Wales are exported (either between those regions or, primarily, to England).

3.36 In North Wales, the main aggregate exports, by far, are those of Carboniferous Limestone which primarily are supplied to North West England. The AM Survey figures for North Wales generally show that, as overall sales fell during the recent recession – between 2005 and 2009, the proportion (as well as the totals) of exports also fell. This implies that, during periods of recession, for general-purpose limestone aggregates, there is a reduced dependence by importing regions on supplies from more distant sources, as would be expected. But the reverse is also true: as the economy has recovered from recession, since 2009, the demand for exports from North Wales has increased once again, and more quickly than the overall rate of economic growth.

3.37 In South Wales, the main export is of sandstone, the vast majority (almost 90%) of which is High Specification Aggregate (HSA) - skid-resistant road surfacing material with a Polished Stone Value (PSV) of 58 or above, and generally much higher (Thompson, Greig & Shaw 1993; Thompson *et al,* 2004). As noted earlier, these exports are of major importance because of the limited sources of unconstrained HSA materials within England. Reference to Table 3.5 shows that, although there was a reduction in sandstone exports between 2005 and 2009, the difference was much less marked than was the case for limestone exports from North Wales, especially in percentage terms. This reflects the fact that the market for skid-resistant road aggregate held up better, during the recession, than was the case for more general-purpose limestone aggregate (presumably because of the safety imperative of continuing to maintain skid resistance on major roads).

Table 3.5: Summary of Regional-scale export data from recent AM Surveys

Note: all figures exclude sales for non-aggregate use	**AM2001** (mt)	**AM2005** (mt)	**AM2009** (mt)	**AM2014** (mt)
North Wales (data from Table 4k of the AM reports)				
Land won Sand & Gravel Sales	1.342	1.192	0.589	0.897
S&G Exports*	0.544	0.508	0.128	0.158
Exports as % of S&G total	**41%**	**43%**	**22%**	**18%**
Limestone Sales	6.062	4.641	2.636	3.508
Limestone Exports*	3.344	2.973	1.116	2.226
Exports as % of Limestone total	**55%**	**64%**	**42%**	**64%**
Igneous Sales	1.136	1.022	0.610	0.660
Igneous Exports*	0.091	0.277	0.064	0.054
Exports as % of Igneous total	**8%**	**27%**	**10%**	**8%**
Sandstone Sales	0	0	0	0
Sandstone Exports*	0	0	0	0
Exports as % of Sandstone total	**0%**	**0%**	**0%**	**0%**
Total Crushed Rock Sales**	7.198	5.663	3.245	4.168
Total CR Exports*	3.436	3.251	1.178	2.280
North Wales CR Exports as % of CR total	**48%**	**57%**	**36%**	**55%**
South Wales (data from Table 4j of the AM reports)				
Land won Sand & Gravel Sales	0.115	0.304	0.144	0.205
S&G Exports*	0.001	0.011	0	0
Exports as % of S&G total	**1%**	**4%**	**0%**	**0%**
Limestone Sales	6.536	6.137	4.554	4.540
Limestone Exports*	0.262	0.154	0.052	0.332
Exports as % of Limestone total	**4%**	**3%**	**1%**	**7%**
Igneous Sales	0.838	1.238	1.025	1.577
Igneous Exports*	0.572	0.430	0.694	0.829
Exports as % of Igneous total	**68%**	**35%**	**68%**	**53%**
Sandstone Sales	2.648	3.498	2.605	1.709
Sandstone Exports*	1.457	1.941	1.258	0.852
Exports as % of Sandstone total	**55%**	**55%**	**48%**	**50%**
Total Crushed Rock Sales**	10.310	10.873	8.185	7.825
Total CR Exports*	2.302	2.527	2.003	2.013
South Wales CR Exports as % of CR total	**22%**	**23%**	**24%**	**26%**

* 'exports' are primarily to England but include some movement between South Wales and North Wales.
** Unlike the figures used elsewhere in this Review, crushed rock sales in the AM reports exclude slate

3.38 Wales has always been a net exporter of construction aggregates and imports of land-based aggregates from England are very minor, by comparison with exports. In North Wales, imports in 2014 (from Table 5k of the AM 2014 report) amounted to just 0.023mt of land-won sand & gravel, and only 0.128mt of crushed rock, most of which comprised igneous rock from neighbouring South Wales and Limestone from South West England. In South Wales in 2014 (from Table 5j), land-based imports amounted to 0.042mt of sand & gravel and 0.079mt of crushed rock, primarily limestone from South West England.

3.39 Imports and exports of marine-dredged sand and gravel between England and Wales are only relevant to the RTS apportionment exercise if they affect the continuity of supply of these materials to Wales and thus give rise to increased demand on land-based resources. This is potentially an issue in South East Wales which, as noted earlier, is heavily dependent upon marine aggregates. At the time of the First Review, Wales was a net importer of marine sand & gravel, dredged from the English side of the median line in the Bristol Channel and the Severn Estuary. This was noted in the Review as being likely to change, subject to the approval of new licence applications within Welsh waters. By 2019, the relative balance between imports and exports has shifted as a consequence of a new licence that has been recently permitted across the median line between English and Welsh waters. However, significant trade continues from English licences to Welsh markets as well as vice versa. In Liverpool Bay, the only licence area in Welsh waters remains a net exporter to north west English markets.

3.40 Recent AM Surveys have also included information on aggregate movement between sub-regions. In Wales the sub-regions used for this purpose[10] comprise:

- **North-East Wales** (Conwy, Denbighshire, Flintshire and Wrexham);
- **North-West Wales** (Isle of Anglesey, Gwynedd & the Snowdonia National Park);
- **South-East Wales** (Swansea, Neath Port Talbot, Bridgend, Rhondda Cynon Taf, Merthyr Tydfil, Caerphilly, Blaenau Gwent, Torfaen, Monmouthshire, Newport, Cardiff and the Vale of Glamorgan); and
- '**the Remainder of South Wales**' (Pembrokeshire, Pembrokeshire Coast National Park, Ceredigion, Carmarthenshire, Powys and the Brecon Beacons National Park).

3.41 Table 3.6, below, shows the results for crushed rock, for each mineral planning authority. In each case, figures are given for sales within the same sub-region, sales to directly adjoining sub-regions within Wales, and sales to other sub-regions, including those in England.

3.42 Similar data is available for sand & gravel aggregates, although the quantities involved are extremely small, except in the case of Wrexham, where 51% is sold within NE Wales, 27% in NW Wales and 22% elsewhere (primarily England).

[10] The sub-regions used for the AM Surveys should not be confused with those used for the analysis of future apportionments in this Review, as described on page 53 and shown in Figure 5.2.

Table 3.6: Sub-Regional export data for crushed rock aggregates* from the AM 2014 Survey report (Mankelow et al, 2016)**, expressed as percentages of total sales.**

Note: all figures exclude sales for non-aggregate use	Sales within sub-region	Sales to adjoining sub-regions in Wales	Sales to other sub-regions and to England
North Wales (data from Table 9k of the AM report)			
Conwy	25%	40%	35%
Denbighshire**	(44%)	(0%)	(56%)
Flintshire	33%	0%	66%
Gwynedd	77%	21%	3%
Isle of Anglesey	70%	17%	12%
Wrexham	-	-	-
South Wales (data from Table 9j of the AM report)			
Blaenau Gwent	100%		0%
Brecon Beacons National Park	2%	98%	0%
Bridgend	100%	0%	0%
Caerphilly	54%	46%	
Cardiff	39%	61%	0%
Carmarthenshire	23%	77%	0%
Ceredigion	100%	0%	0%
Monmouthshire	-	-	-
Neath Port Talbot	11%	57%	32%
Newport	-	-	-
Pembrokeshire	66%	34%	0%
Pembrokeshire Coast National Park			
Powys	26%	6%	68%
Rhondda, Cynon, Taf	80%	0%	20%
Swansea	-	-	-
Torfaen	-	-	-
Vale of Glamorgan	65%	35%	0%

* Unlike the figures in Tables 3.3 and 3.4, above, crushed rock sales exclude slate

** Denbighshire was omitted from Table 9k of the AM 2014 report, so the figures shown here are from AM 2009.

Agreed Methodology

3.43 The foregoing analysis indicates that there is very little clarity in terms of likely future trends in the demand for construction aggregates in Wales. As noted earlier, a decision was therefore made that the RTS should focus on matching future aggregates provision with a combination of historical sales data and the planned requirements for housing construction in Local Development Plans, rather than relying on any kind of detailed econometric forecasting.

3.44 Given that the relationship, such as it is, between house construction and aggregate sales is demonstrable at the national level, but not at regional or sub-regional levels, it is logical that figures for future provision should be set at the national level, and subsequently cascaded down to the regions, sub-regions and individual LPAs.

3.45 Following a detailed consideration of several options and permutations, the methodology agreed with the RTS Steering Group[11] was that this should entail four sequential stages, as set out below.

STAGE 1: National Provision

- Calculate the overall level of future aggregates provision in Wales at a national level by combining the historical sales average (taking the highest of the 10-year and 3-year averages for each LPA, for the reasons given in para. 3.8 above) with a factor which reflects the planned level of future housing construction activity, compared with that seen over the same 10-year baseline period (for details, see Chapter 5);

STAGE 2: Regional Split

- Divide the national figure between North Wales and South Wales, on the basis of the historical sales split between those regions which, as noted in paragraph 24 of MTAN1, has remained reasonably consistent over many years;

STAGE 3: Sub-Regional and LPA Apportionments

- Sub-divide the regional figures between a series of seven ***sub-regions*** (defined for the purpose of this Review[12]) and, *provided that it is feasible to do so*, between each of the constituent Local Planning Authorities (LPAs).
- In most cases, the distribution of apportionments within each sub-region is to be achieved through a combination of *quantitative* and *qualitative* judgements, exercised by the RTS Steering Group and facilitated by the appointed consultant. The judgements should aim to reflect the Steering Group's collective understanding of market requirements (reflecting both historical sales and the distribution of planned housing activity) together with considerations of existing landbanks, the proximity principle and environmental capacity.
- In a few areas, notably where there has been no production of land-won aggregates for many years, with no permitted reserves and zero apportionments, it might sometimes be more appropriate for the RTS apportionments to be subject to more detailed investigation by all of the LPAs within that particular sub-region and to industry responses to future calls for sites within those LPAs;

[11] comprising Welsh Government, the two RAWP secretaries, National Resources Wales, the Mineral Products Association, the British Aggregates Association and representatives of one local authority from each Region

[12] The sub-regions were created, at Welsh Government's suggestion, for the specific purpose of facilitating strategic minerals planning and collaborative approaches between LPAs. They each represent distinctive 'market areas' between which there is relatively little movement of aggregates, except for exports to England, and within which detailed, strategic consideration can be given as to the most appropriate patterns of supply.

STAGE 4: Sand & Gravel / Crushed Rock Split, and Allocations

- Sub-divide each LPA apportionment by aggregate type (sand & gravel or crushed rock), based on the recent historical sales split for that LPA and/or resource availability;
- Then determine the requirements for new allocations within individual LPAs by comparing the apportionment requirements over 22 years (for sand & gravel) or 25 years (for crushed rock)[13] with existing landbanks.

3.46 Further details regarding the implementation of this methodology are presented in Chapter 5, below but first, to inform the qualitative element of Stage 3, it is useful to review the nature and adequacy, or otherwise, of the existing pattern of supply.

[13] These derive from the minimum landbank requirements of 7 years for sand & gravel and 10 years for crushed rock, being required throughout an ***entire*** 15-year plan period, as set out in MTAN 1. An exception to this occurs in Cardiff, where the LDP Plan Period is 20 years, necessitating the calculation of total apportionments for crushed rock over 30 (rather than 25) years.

4. Analysis of the Existing Supply Pattern

Introduction

4.1 Planning Policy Wales, paragraph 5.14.1 requires that, in order to provide for society's ongoing needs there should be a steady and adequate supply of construction-related minerals and mineral products. Paragraph 5.14.2 highlights the need to balance this fundamental requirement with the protection of amenity and the environment. This goes to the heart of the RTS process and requires that, as well as balancing supply and demand, consideration is given to the adequacy or otherwise of the existing pattern of supply, from a sustainability perspective. As explained in Chapter 2, this requires at least qualitative assessment of the pattern with respect to both proximity and environmental capacity.

4.2 In the original (2008) RTS, proximity was only considered in terms of the 'per capita' demand analysis which, as noted earlier, is difficult to justify. There is little, if any, correlation between aggregate sales and population size. Population density, together with the location of existing urban development, were examined, qualitatively, in the First Review, to provide some indication of the geographical areas where new construction is most likely to be concentrated. Proximity to such areas was seen as one measure of the sustainability of existing quarries, and a desirable factor in the location of new ones - subject, of course, to the availability of resources in those locations and to the consideration of other practical and environmental factors. In the present review, as well as population density, the additional factor of planned housing construction is also being considered.

4.3 The concept of environmental capacity was considered, in the original RTSs, only in terms of providing qualitative descriptions for each LPA, based on outputs from the IMAECA analysis. It had no influence at all on the resulting apportionments or allocations (although future working within National Parks was discouraged as a more general matter of Policy - paragraphs 21 and 22 of the former MPPW; and paragraphs. 46, 49, 51, 52 & 53 of MTAN1).

4.4 In the course of the First Review, a determined attempt was made to use both the proximity principle and environmental capacity to better effect, in conjunction with an understanding of resource availability and historical supply patterns, in order to enhance, if possible, the spatial distribution of future supply sources. That process is continued in this Review, taking account of the additional information now available on the spatial distribution of planned future housing provision.

4.5 In considering such enhancement, it must be remembered that supply patterns are crucially dependent on the availability of suitable resources and on the commercial viability of working them. Minerals can only be worked where they are found. Moreover, they can only be worked on a commercial scale where quarry operators are willing to invest in their extraction, and in the procedures necessary to avoid (or minimise) potential adverse environmental impacts. In most cases, the detailed economic and commercial factors involved for individual sites cannot adequately be assessed at the strategic level represented by the RTS.

4.6 It must also be remembered that improved proximity might sometimes be at the expense of reduced environmental capacity; whilst improved capacity might be at the expense of increased transportation distances, with consequential increases in carbon emissions and traffic impacts. The two factors therefore need to be considered in combination.

4.7 Consideration also needs to be given to other factors, including the relative merits of extensions to existing quarries as opposed to new 'greenfield sites'; the need to avoid stifling competition between different operators; and the need to maintain productive capacity – both to maintain a healthy degree of competition between different operators and to ensure that the supply pattern has the necessary resilience to be able to cope with periodic spikes in demand (as, for example, may be associated with major infrastructure projects or other large-scale development initiatives).

4.8 These detailed issues can most effectively be dealt with at a local level, however, once the overall strategy has been established. For this reason, the following analysis begins with a consideration of the broad, national and regional picture, with more detail being provided in the sub-Regional analyses presented in Appendices A and B. The key findings are then carried through to the assessment of future apportionments and allocations, in Chapter 5.

National and Regional Analysis

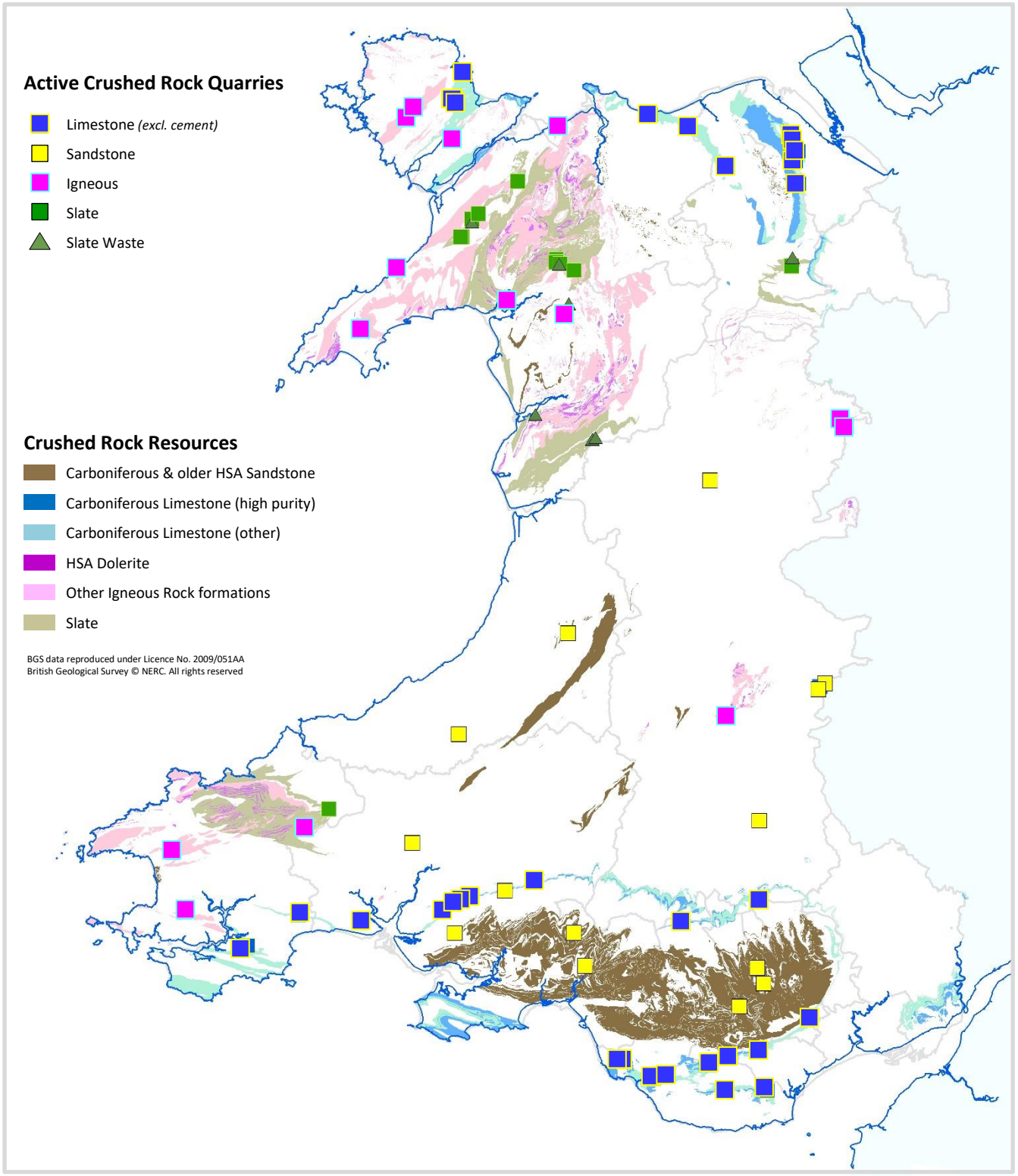
Distribution of Quarries and Resources

4.9 As noted above, the distribution of suitable geological resources is of fundamental importance in understanding the distribution of existing quarries, and in understanding the limitations involved in locating potential new ones. Once again, it is important to stress that minerals can only be worked where they are found.

4.10 Figure 4.1, below, shows the distribution of crushed rock quarries in Wales which were active in 2018, together with the outcrops of the key resources. The quarry locations are taken from an updated edition of the BGS 'Britpits' database[14], limiting the selection to those which produce hard rock aggregates, either as a primary product or (in the case of slate waste tips) as a secondary material. Larger scale maps, which show the locations of inactive and dormant, as well as active quarries, are presented in the more detailed analysis contained within the Regional Appendices (A and B).

[14] A 2018 edition of the Britpits database was supplied by the BGS at the outset of this study but was then updated by the RAWP secretaries, particularly in terms of current operational status and ownership.

Figure 4.1: Active Crushed Rock Aggregate Quarries and Resources in Wales, 2018



4.11 The resource outcrops on Figure 4.1 are taken directly from the digital dataset produced for the BGS Mineral Resources Map of Wales (Humpage & Bide, 2010), but are limited to those resources which are important for the production of crushed rock aggregates. These include all 'Category 1' resources, as identified on the BGS

maps, and some (but not all) 'Category 2' resources. They fall into seven main groups, as follows:

- Carboniferous HSA sandstones (Category 1)
- Pre-Carboniferous HSA sandstones (Category 2)
- High Purity Carboniferous Limestone (Category 1)
- Other Carboniferous Limestone (Category 2)
- HSA dolerites (Category 1)
- Other igneous rock formations (Category 2)
- Slate (Category 2)

4.12 The term 'HSA' refers to 'High Specification Aggregate', which is suitable for use as skid-resistant road surfacing aggregate as defined in the original 'Travers Morgan' report on these materials for the former Department of the Environment (Thompson, Greig & Shaw, 1993). They are characterised by a high Polished Stone Value (PSV≥58) in combination with a low Aggregate Abrasion Value (AAV≤16) and tend to command a premium price compared with other types of road aggregate. They are also transported over much greater distances in order to meet specification requirements in areas which have no comparable indigenous resources (which includes most of eastern and southern England). HSA aggregates in Wales include certain types of hard sandstone (particularly the Carboniferous 'Pennant' Sandstones of the South Wales coalfield, and some older sandstones - mainly within Powys), and certain types of dolerite (a particular variety of igneous rock) which occurs within various parts of south-west, north-west and mid-Wales.

4.13 It should be noted that some of the extensive sandstone formations within mid-Wales and North Wales that were identified as potential HSA resources within the 1993 Travers Morgan report have since been refined by the most recent and more detailed BGS resource mapping, such that only parts of those resources are now identified as potential sources of HSA material on a commercial scale.

4.14 The usual caveat should be added that not all of the outcrops, of any of the rock types or formations listed at para. 4.11, above, will necessarily be suitable for commercial quarrying. This is because all geological materials are inherently variable, from one part of their outcrop to another. Moreover, the commercial viability of extraction is also influenced by a large number of other practical issues including the local extent of the deposit, land ownership, access, and distance from market, as well as planning and environmental constraints.

4.15 Above all, it must be emphasised that Figure 4.1 (and Figure 4.2 below) displays the extent of potential **resources** and not **permitted reserves**. Resources are geological materials, including rock formations and naturally occurring sand & gravel deposits, which have the ***potential*** to be used for a particular purpose (in this case as construction aggregates). Reserves, in the broadest sense, are those parts of a resource which are ***known*** to be suitable for this purpose (usually as a result of detailed ground investigations and laboratory testing) and permitted reserves are

those which have valid planning permission for the winning and working of the materials in question.

4.16 Excluded from Figure 4.1 are a range of weaker sandstones and limestones, including some 'Category 2' resources, which are not currently exploited as sources of crushed rock aggregate on anything other than an extremely local scale (e.g. for use on farms etc.), and where this is most unlikely to change in future, because of their inherent unsuitability for more commercial applications. Such resources include all Devonian sandstones and all post-Carboniferous sandstones and limestones. Whilst many of these have been identified by the BGS as being worthy of safeguarding within Local Development Plans (Wrighton & Humpage, 2012), they do not represent practical alternatives to the resources listed above, in terms of their ability to meet the same commercial specifications and are therefore not considered further here.

4.17 Figure 4.2, below, provides a similar map of the distribution of land-based sand & gravel pits, together with the corresponding potential resources. The latter are once again taken largely from the BGS Mineral Resources Map of Wales and include a wide range of sediments which have potential as sources of natural aggregate. The same caveats apply as for the crushed rock resources noted above.

4.18 Figure 4.2 also shows, within NW Wales and SE Wales, more specific potential resource blocks which were identified in more detailed studies carried out for the National Assembly for Wales (Thompson et al., 2000; University of Liverpool, 2003). These are not necessarily the only potential worthwhile resources, but they are the most rigorously assessed, within the areas concerned.

4.19 Figure 4.3, which follows, shows the areas which are within an illustrative 20km radius of one or more currently active crushed rock quarries; and Figure 4.4 provides a similar illustration in respect of both land-based sand & gravel quarries and ports which receive marine-dredged aggregates (principally sand).

4.20 In most cases, the economic radius of distribution from these locations is considerably greater than 20km: typically up to 50km for 'ordinary' graded aggregate or further in the case of value-added products (e.g. ready-mixed concrete and asphalt materials) that are often produced at remote depots for onward distribution, and much further still in the case of High Specification Aggregates or High Purity limestone.

4.21 The diagrams merely illustrate that the existing pattern of supply within Wales already conforms reasonably well to the Proximity Principle: very few parts of the country (those shown in black on Figure 4.3) are more than 20km from a source of crushed rock aggregate and many of those which are further away fall within 20km of either a land-based sand & gravel pit or a wharf which imports marine-dredged aggregates. Elsewhere, the distances are more than 20km but rarely more than 30km, and in most cases these are remote rural areas which are unlikely to generate significant levels of demand.

Figure 4.2: Land-based Sand & Gravel Pits and Resources in Wales, 2018

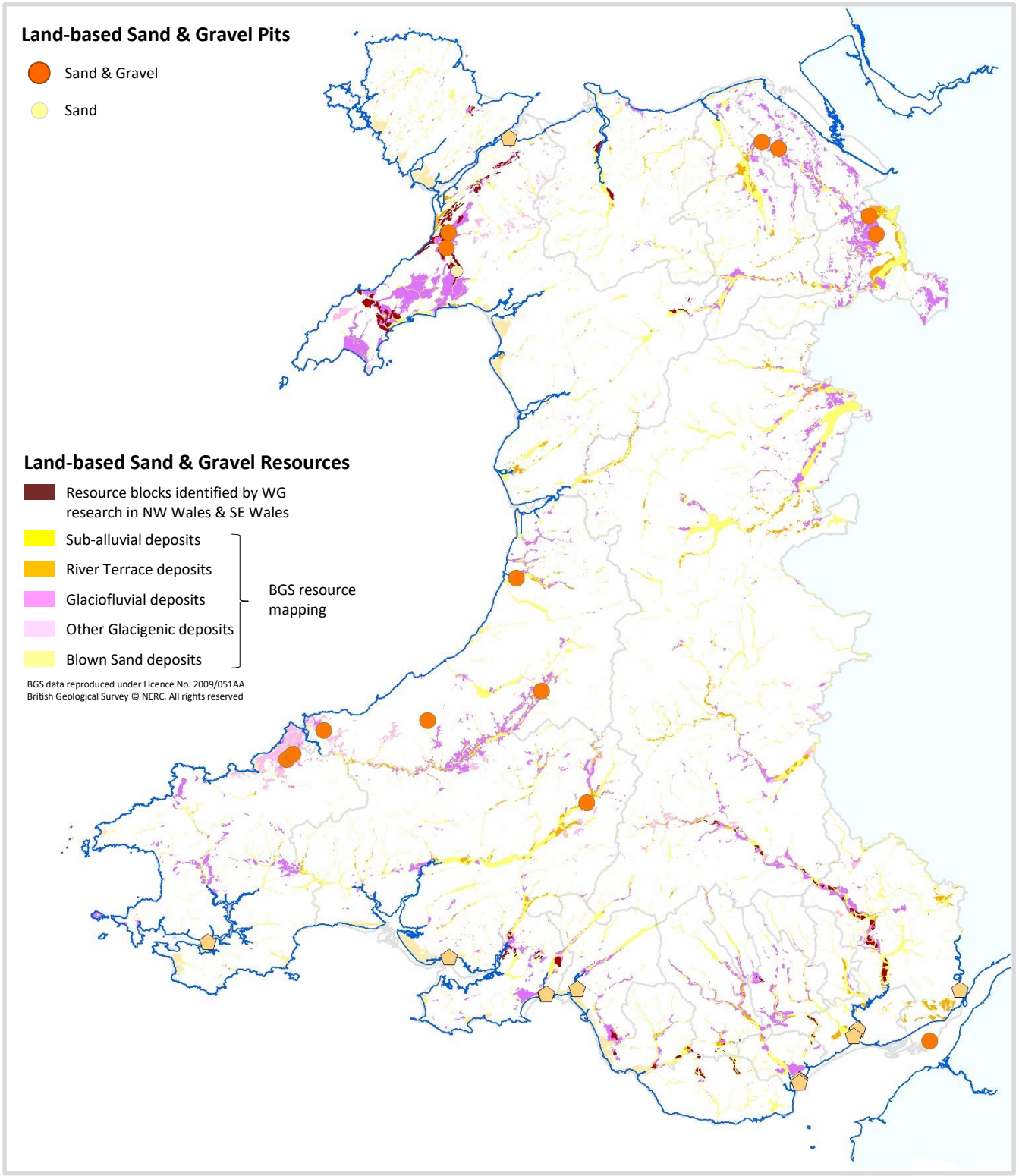


Figure 4.3: illustrative 20km radii from all active crushed rock quarries in Wales, 2018.

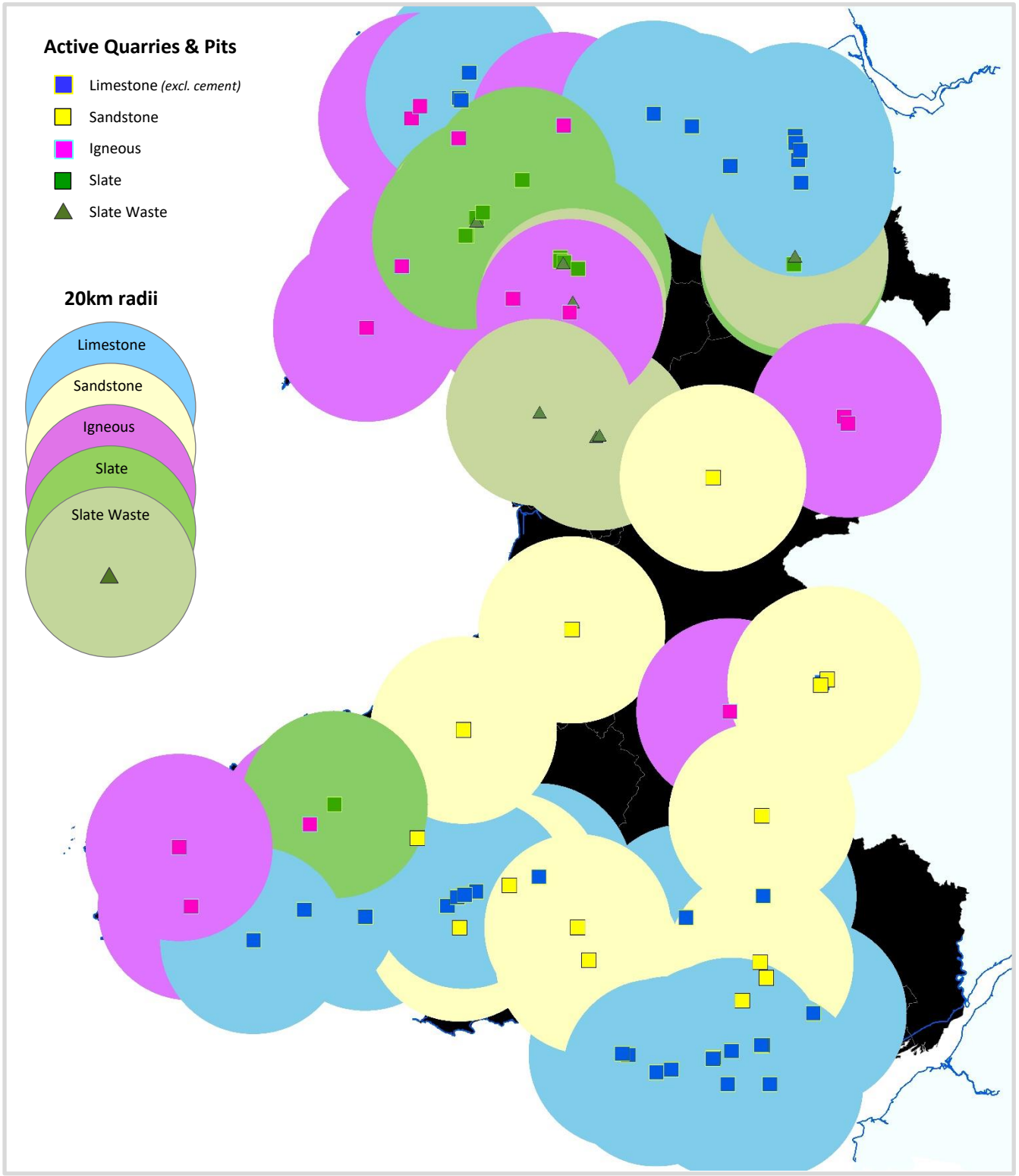
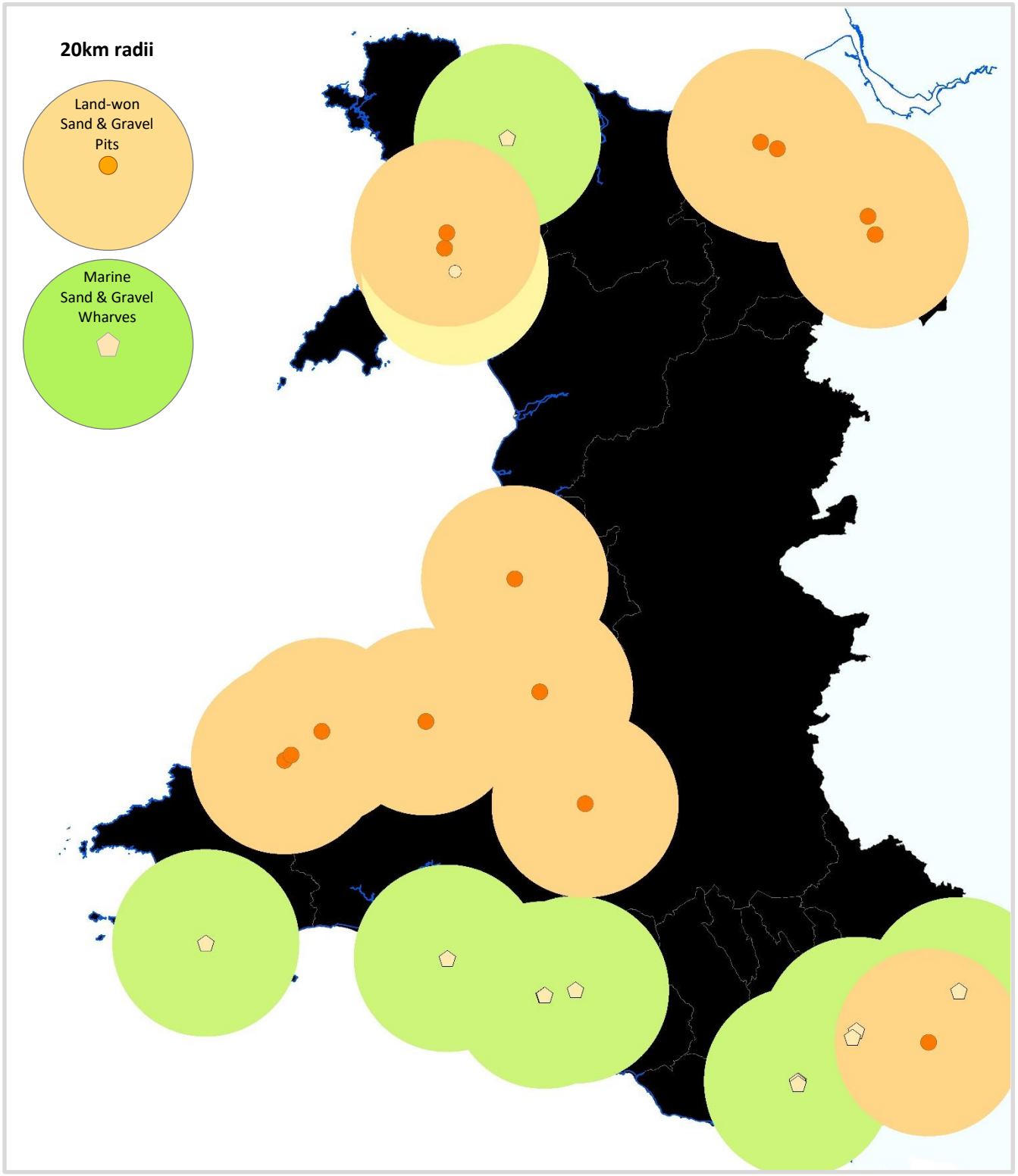


Figure 4.4: illustrative 20km radii from all active sand & gravel pits & wharves in Wales, 2018.



4.22 Figure 4.5, below, shows the distribution of crushed rock quarries in relation to the scale of crushed rock aggregate production, as measured by average historical sales figures for each LPA over the baseline period (2007-2016). The shading corresponds

to the figures given in Tables 5.4 and 5.6 in Chapter 5[15]. It is emphasised that this illustrates variations in production, not demand, and therefore includes both domestic consumption and exports to adjoining areas, including England. Figure 4.6 then provides a similar map for land-based sand & gravel production, displaying the data from Tables 5.3 and 5.5.

4.23 The focus of production for crushed rock is clearly seen, from Figure 4.5, to be in North-East Wales - particularly Flintshire (which is where most of the exporting Carboniferous Limestone quarries are located); and in Powys, where a number of sandstone and igneous rock quarries supply HSA material to England - particularly to adjoining parts of the West Midlands. In the rest of South Wales the picture is distorted by the much smaller size of many of the individual unitary authorities, particularly in the south-east, where the totals for each LPA are less than for the much larger county of Powys, even though overall production within SE Wales is double the total for Powys.

4.24 Historical crushed rock sales in South Wales have been concentrated within the Carmarthenshire, Bridgend, Vale of Glamorgan, Rhondda Cynon Taf and Cardiff LPAs (which is where most of the larger Carboniferous Limestone quarries in South Wales are located), and in the adjoining LPAs of Caerphilly and Neath Port Talbot, where additional HSA sandstone quarries are also located. Whereas much of the crushed rock production within NE Wales is supplied to the neighbouring parts of North West England, particularly Merseyside, most if not all of the limestone production in South East Wales appears to be utilised locally, within the producing areas, and within the adjoining LPAs of Swansea and Neath Port Talbot, to the west, and those of Merthyr Tydfil, Caerphilly and the 'Former Gwent' authorities to the east. Although Carboniferous Limestone resources do exist in these adjoining areas, they are either less extensive and/or more heavily constrained (see Appendix B for more detailed analysis).

4.25 The fact that little or none of the limestone from South Wales is exported further east, into England, is evidenced by the fact that additional Carboniferous Limestone from the Forest of Dean in Gloucestershire is currently being imported into the former Gwent area to make up for what would otherwise be an overall shortfall of supply. Although SE Wales has significant exports of crushed rock to England, most if not all of those exports are of HSA from the Pennant Sandstone formations of the South Wales Coalfield.

4.26 Overall, the pattern of crushed rock aggregate production outlined above relates largely to the availability of resources, the location of established supply units and the proximity of these to the main areas of construction activity and/or to major transport routes such as M4 corridor. Further analysis of the supply pattern, including the relationships between quarry locations, resources, markets, major designations and environmental capacity, is provided in paragraphs 4.30 *et seq*., below, and in the two Regional Appendices.

[15] The exception being Snowdonia National Park, which is combined with Conwy in Table 3.1, for confidentiality reasons, but which in fact had very limited production over the baseline period, from a single site.

Figure 4.5: Spatial Distribution of Crushed Rock Production within each LPA, based on Average Sales 2007 - 2016, with locations of Active Crushed Rock Aggregate Quarries (2018)

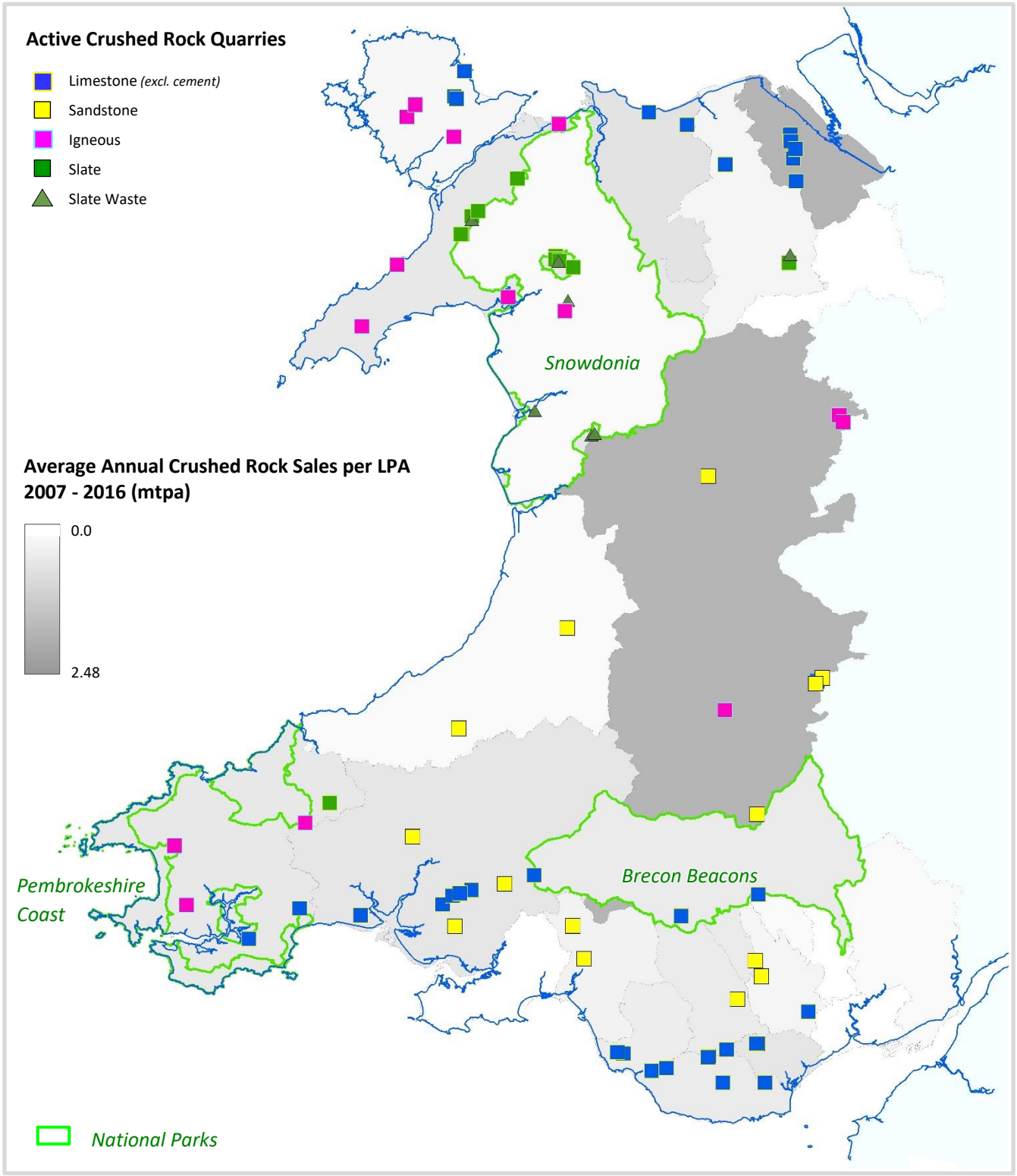
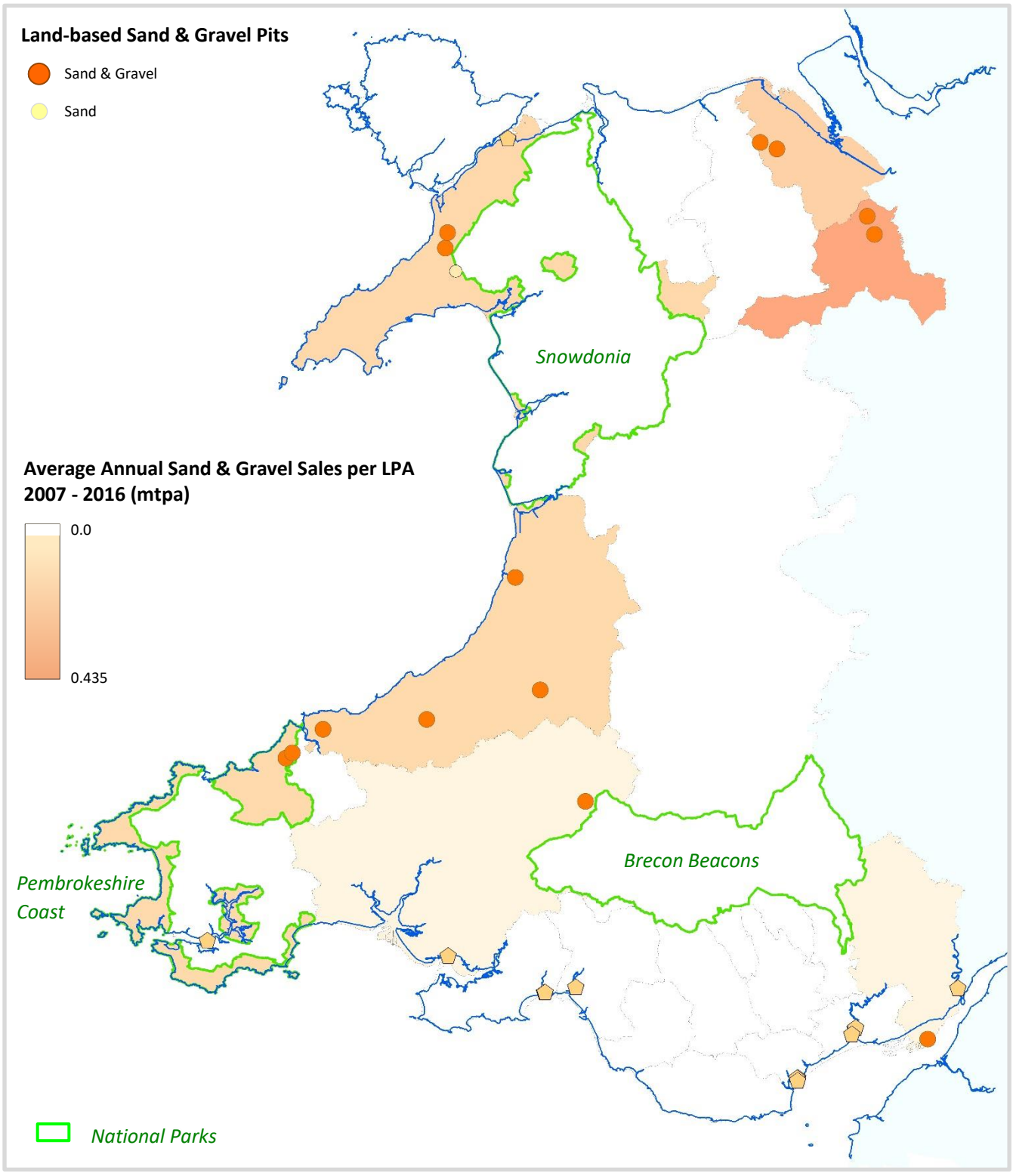


Figure 4.6: Spatial Distribution of Land-won Sand & Gravel production within each LPA, based on Average Sales 2007 - 2016, with locations of Sand & Gravel Pits (2018)



4.27 Looking to the future, any undue reliance on historical supply data would inevitably reinforce and perpetuate the same patterns of supply. More careful consideration is therefore needed where such reliance would unnecessarily perpetuate adverse environmental effects or unjustified inequalities in the balance of supply between neighbouring authorities (see also para. 4.27, above); or where undue reliance might otherwise be placed on the continued availability of supplies from an adjoining LPA or country (e.g. imports from Gloucestershire into SE Wales). In addition, any imposed change to the existing supply pattern may, in some cases, either necessitate working less suitable, thinner or otherwise less viable resources, where these exist, or (in some cases at least) may entail increased transportation distances, with consequential increases in carbon emissions and traffic impacts. All of these issues are explored in more detail in the sub-regional analyses within Appendices A and B.

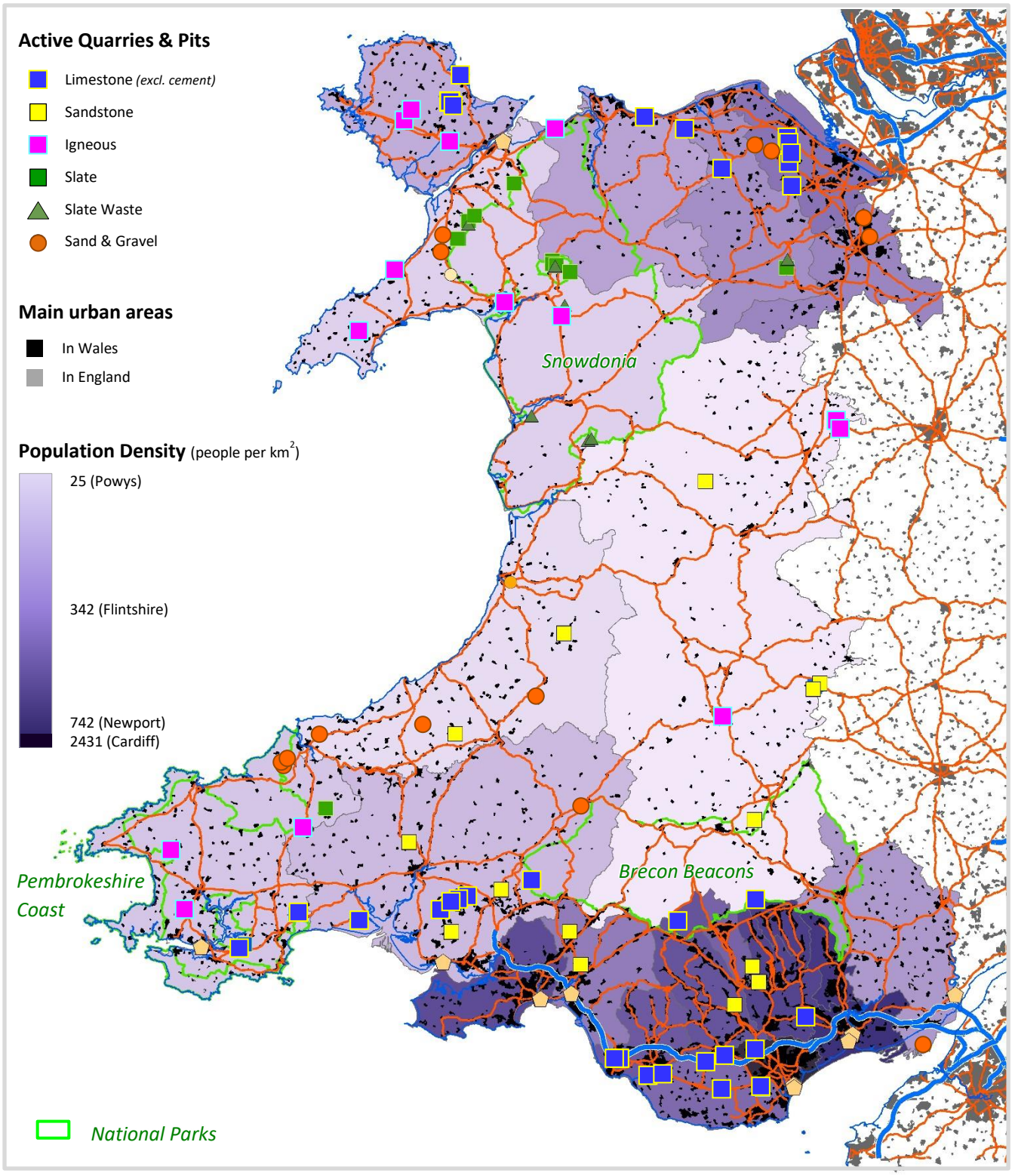
4.28 In the case of sand & gravel production, as illustrated in Figure 4.6, the picture is greatly distorted by the reliance of South East Wales, in particular, on marine-dredged aggregates from the Bristol Channel and the Severn Estuary. South West Wales is less dependent on marine aggregates and has a small number of active land-based sites. Powys is too far removed from the coast to be influenced to any significant degree by marine aggregates, but still has only one very small land-based sand & gravel site currently in operation. It is reliant instead on crushed rock material, despite the apparent resources of natural sand & gravel within the upper reaches of the Severn, Wye and Usk valleys. In North Wales, there are, once again, apparently plentiful resources of natural sand & gravel in Gwynedd (as indicated in both BGS and Liverpool University mapping) but the supply pattern is dominated by one major quarry within Wrexham and (to a much smaller extent) by two further units within Wrexham and two or three others in Flintshire. Further details are given in the Regional Appendices.

4.29 Overall, in South Wales and much of North Wales, the relative lack of land-based sand & gravel production is influenced to a very large extent by environmental and landscape concerns, as well as by the relative ease of availability of alternative materials (marine aggregates, crushed rock and slate, including slate waste).

Comparison of the Supply Pattern with Population Density and Transport Links

4.30 Figure 4.7, below, shows the distribution of all currently active quarries and pits throughout Wales in relation to variations in population density by local authority area. It also shows urban areas, A-roads and motorways. Additional local roads, not shown on this map, will also be utilised close to individual quarries, distribution depots or customer locations. Together, the areas of high population density and the main urban areas provide a good indication of where construction activity, as a whole, is most likely to be concentrated, but the locations of major transport routes, such as the A55 in North Wales, and the M4 corridor in South Wales have important influences on export distribution. The map does not show railways, which are generally not used for aggregate distribution, though they are important for a few of the quarries in the South Wales coalfield area and along the North Wales coast.

Figure 4.7: LPA Population Densities (2010) and main urban areas, as approximations for the overall pattern of demand for construction aggregates, with motorways, A-roads, national landscape designations and locations of all active quarries & pits (2018)



4.31 In North Wales, the highest population density occurs within Flintshire and Wrexham, coinciding with the highest levels of crushed rock and sand & gravel output, respectively, within that region (see figures 5.5 and 4.6, above). The road network in these areas also provides ease of access for exports into the conurbations of North West England, including the Wirral, Liverpool and Warrington. The main apparent anomaly here is the absence of crushed rock production within Wrexham. Although Carboniferous Limestone resources do exist in the western part of this authority, they fall almost entirely within the Clwydian Hills AONB. It will generally not be appropriate for new allocations to be identified within such areas, unless there are no viable alternatives within neighbouring Flintshire or Denbighshire. This is discussed at greater length in Appendix A, as is the need to maintain sand & gravel supplies within North West Wales by developing further resources in Gwynedd.

4.32 In South Wales, there is some coincidence between the areas of high population density and urban areas, on the one hand, and the distribution of crushed rock sales and quarries, on the other, but the relationship is less clear than in the north and the need for adjustments to the future supply pattern is, in some cases, more compelling. In particular, the areas of Newport, Torfaen, Blaenau Gwent and Caerphilly have higher population densities than those of the Vale of Glamorgan, Bridgend and RCT, but it is in the latter areas where most of the Carboniferous Limestone outcrops and quarries are located. Similarly, Swansea has a high population density but no active quarries or pits, relying instead on neighbouring Carmarthenshire for most of its limestone supplies, on Neath Port Talbot for supplies of road surfacing aggregate, and on marine dredged sources landed at Swansea Wharf for building sand. As with Wrexham in North Wales, Swansea does have indigenous resources of Carboniferous Limestone but again these are almost entirely within an AONB designation – that of the Gower Peninsula.

4.33 As noted in the First Review, the distribution of crushed rock quarries in this area as a whole is therefore not ideally matched with the main areas of demand, suggesting that there may need to be some adjustment in terms of future apportionments, on the grounds of proximity. This, however, needs to be examined in more detail and balanced against both environmental capacity and commercial factors – not least including the availability or otherwise of workable resources within and outside national landscape designations. Further commentary on this is given in Appendix B.

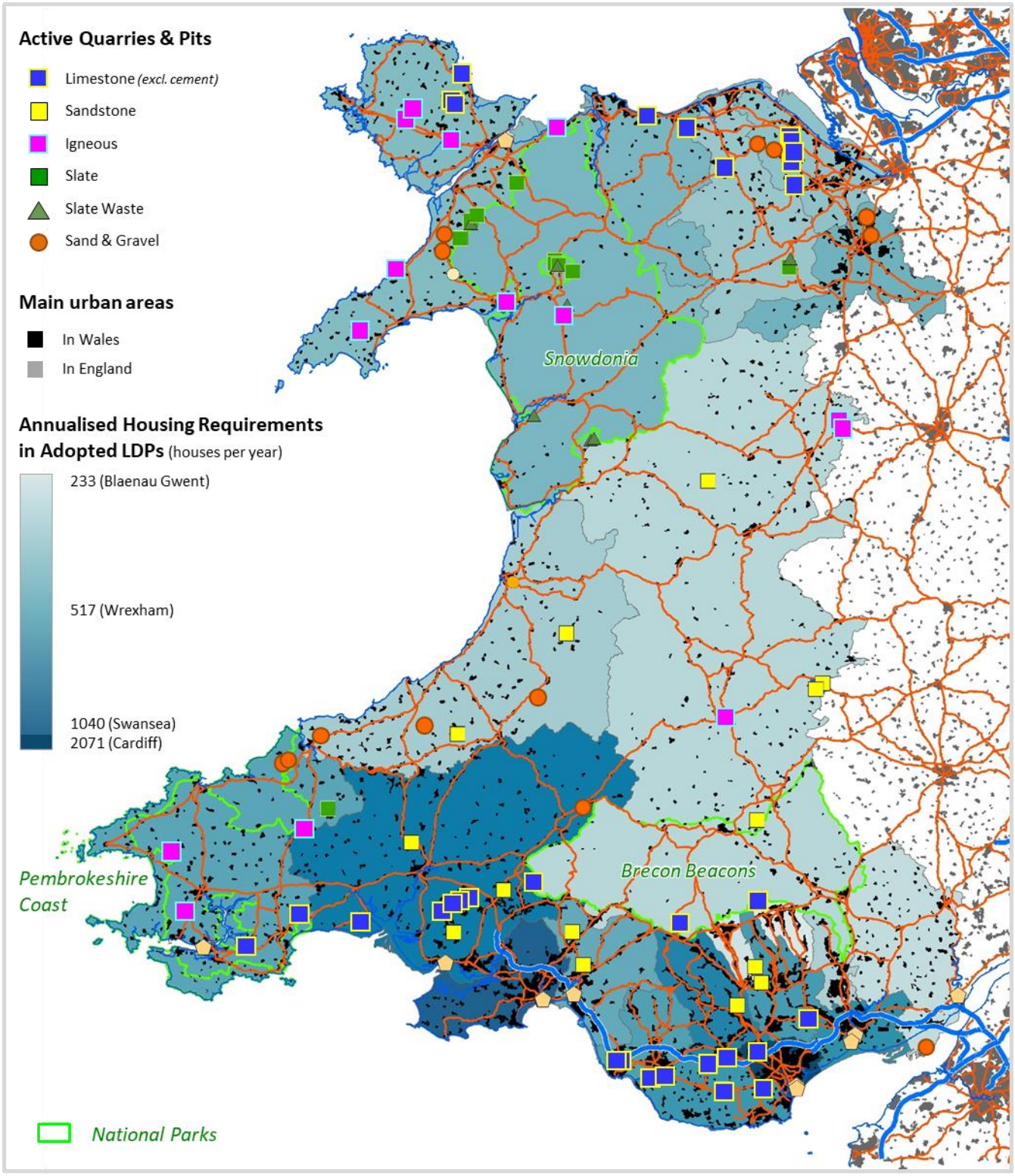
4.34 In mid Wales, there is a marked contrast between the very low population density of Powys and the high level of demand placed upon that County, in terms of crushed rock sales (compare Fig 4.7 with Fig 4.4). This, as noted earlier, is primarily due to a number of large quarries within Powys which export High Specification Aggregates by road to markets in England. Taking that into account, together with the distribution of these important resources, these quarries are clearly well-placed in terms of proximity to the relevant markets and transport routes.

Comparison of the Supply Pattern with Planned Development

4.35 Consideration also needs to be given to the distribution of supply sources in relation to that of the planned distribution of new housing provision since, as explained in

Chapter 3, this is likely to have an important influence on the location of future aggregate consumption. Figure 4.8, below, therefore illustrates the distribution of active quarries in relation to the annualised rates of housing provision set out in Local Development Plans.

Figure 4.8: Annualised Planned (LDP) Housing Requirements in LPAs and National Parks, as partial indicators of the pattern of demand for construction aggregates,
with motorways, A-roads, and locations of all active quarries & pits (2018)



4.36 In this case, the indicated pattern of consumption is somewhat closer to the pattern of supply, than is the case when looking at population density. In South East Wales, especially, the housing provision figures are relatively modest in Blaenau Gwent, Torfaen and Monmouthshire, which are served by only a single quarry, but the anomaly is still seen in Swansea, which has the second highest housing provision figures, after Cardiff.

Comparison with Environmental Capacity

4.37 Figure 4.9, below, compares the distribution of active quarries with the spatial variations in Environmental Capacity across most (but not all) of Wales, as indicated by the 'combined scores' from the IMAECA Geographic Information System tool developed by Enviros Consulting Ltd. (2005). As explained more fully in paragraphs 2.14 et seq., above, the tool provides values, relative to arbitrary thresholds between the three coloured categories, for each 1km square which was assessed by the IMAECA project. The areas assessed were identified on the basis of whether or not aggregate resources were present within all or part of each square. Areas which were considered not to contain such resources were not assessed, which is why many parts of the country are left blank.

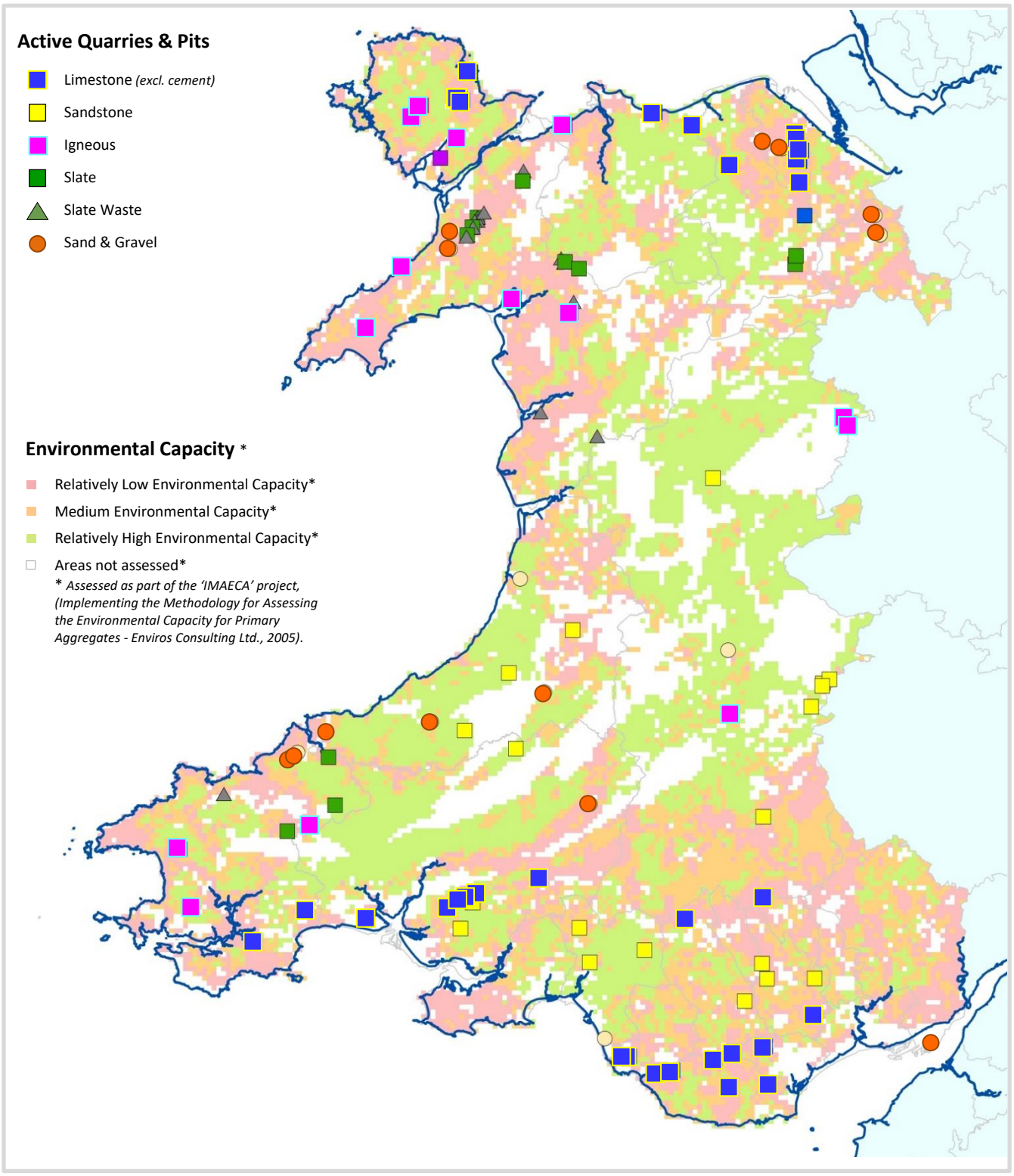
4.38 It should be noted that, whist the GIS tool allows separate results to be shown for different resource categories, those categories do not entirely match with the current BGS mineral resource maps and the resource outlines are therefore quite different. It is therefore more useful to look at the overall picture, as shown in Figure 4.9 (and, at a slightly larger scale but at the same level of detail, in the various maps which accompany the sub-Regional analysis in Appendices A and B).

4.39 It must be emphasised that the IMAECA results are intended only to provide a very broad indication of the capacity of different areas to accept the environmental impacts of additional quarrying activity. They are necessarily generalised and are specifically ***not*** intended to take the place of conventional 'sieve-mapping' within individual Local Authorities, where more detailed constraint maps can be used and site-specific issues can be examined to determine the relative pros and cons of different factors.

4.40 The IMAECA results have also been criticised for the fact that the presence of an existing quarry is treated, in the IMAECA analysis, as a factor which reduces the capacity for further quarrying in that area. Whilst there might be some justification for this, in terms of seeking to minimise cumulative impacts, it conflicts with the widely-held notion that well-designed extensions to existing quarries are likely to be more acceptable, at least in terms of public perception, than the introduction of quarrying to previously undisturbed 'greenfield' sites.

4.41 Bearing all of that in mind, the IMAECA results nevertheless provide a useful starting point for comparing environmental capacity issues with other factors (including resource availability, proximity and commercial viability) in areas where the historical supply pattern is thought to be in need of improvement, from a sustainability point of view. This is examined further in the Regional Appendices (A and B), the key findings of which are summarised at the end of this chapter.

Figure 4.9: Environmental Capacity Assessment (combined scores for each km²), as assessed by the IMAECA project, with locations of all active quarries & pits (2018)



Sub-Regional Analysis of Supply Patterns

4.42 More detailed, sub-regional analyses of the inter-relationships between each of the various factors outlined above were taken into account during Stage 3 of the apportionment process, as summarised in Chapter 5, below. They are described more fully in the Regional Appendices for North Wales (Appendix A) and South Wales (Appendix B).

5. Assessment of Apportionments and Allocations

5.1 The foregoing review of the existing supply pattern feeds into the overall methodology for determining apportionments and allocations for future working, as set out in Chapter 3. This Chapter implements the four sequential stages of that methodology.

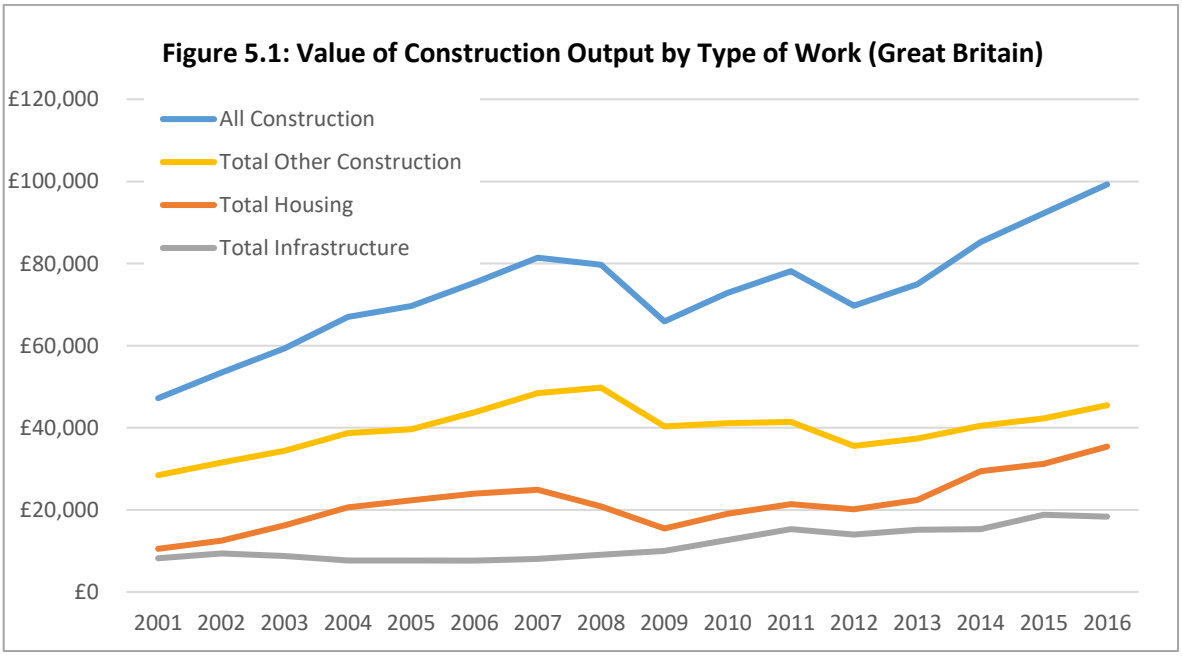
STAGE 1: Setting the National Level for Future Aggregates Provision

5.2 The agreed methodology begins by establishing the overall (national) level of future provision for all land-won primary aggregates in Wales. This is required to be assessed by combining historical sales data (using the highest of 10-year and 3-year averages, as explained in para. 3.8, above, and totalling 15.557mt) with a factor which reflects the planned level of future construction activity, compared with that seen over the same 10-year baseline period.

5.3 Housing is an important element of such activity and one for which quantified requirements and levels of provision are made in local development plans, in a way which can readily be related to aggregate consumption. Clearly, however, housing accounts for only part of the overall level of aggregate consumption. Before deciding on how best to use the housing figures, it is therefore useful to consider the overall breakdown of construction activity. Statistical information on this is not readily available for Wales, but a useful insight can be gained by using data for the whole of Great Britain, which is published annually by the Office of National Statistics (ONS).

5.4 Figure 5.1 and Table 5.1, below, derived from the ONS Construction Statistics Annual 2017, show how housing accounts for just under 30% on average of all new construction work, in terms of value, varying over time from 22% to 36%.

Figure 5.1: Value of Construction Output by Type of Work (Great Britain)



SOURCE: Combined public & private sector data from Table 2.4c in the ONS Construction Statistics Annual, 2017. https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/datasets/constructionstatisticsannualtables)

Table 5.1: Percentage value of construction output by type of work, Great Britain. (SOURCE: as for Figure 5.1)

YEAR	2001	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Housing %	22%	23%	27%	31%	32%	32%	31%	26%	24%	26%	27%	29%	30%	34%	34%	36%
Infrastructure %	17%	18%	15%	11%	11%	10%	10%	11%	15%	17%	20%	20%	20%	18%	20%	18%
'Other' %	60%	59%	58%	58%	57%	58%	59%	62%	61%	56%	53%	51%	50%	48%	46%	46%

5.5 Major infrastructure projects can have a very substantial effect on the demand for construction aggregates within particular areas or regions. Whilst this needs to be reflected in the planning for future aggregates provision, the difficulty lies in the fact that such projects are rarely planned to a reliable delivery timescale and are susceptible to major political and investment decisions which are beyond the scope of the planning system (as demonstrated, for example, in the case of the proposed Swansea Tidal Lagoon, the Wylfa Newydd nuclear power station and the M4 Newport relief road). There is also considerable difficulty in quantifying the requirements for individual projects in terms of the need for construction aggregate. Overall, infrastructure accounts for between 10% and 20% of total construction value, averaging just under 16%. Its influence on overall demand is therefore likely to be much less than that of housing, and far more difficult to quantify.

5.6 The majority (more than half, on average) of total spending is associated with 'other' types of construction activity. These include schools & universities, offices, entertainment, hospitals, factories, warehouses and a variety of miscellaneous work. Whilst all of these will influence the overall demand for construction materials, in many cases the materials used are likely to be dominated by steel and glass, rather than aggregates. Moreover, whilst much of the building work is recognised in Local Development Plans, in terms of allocations for employment, hospitals, schools, etc., there is no mechanism for quantifying the aggregate requirements involved or for comparing planned activity with historical data.

5.7 In recognition of these various observations, and taking account of the close correlation between house building and aggregates provision; the fact that housing accounts for around 30% of all construction activity (at a GB level); and the fact that provision for house building is set to double (at a national level); it would seem justified to allow for a doubling of that 30% element of the overall supply. In other words, in order to ensure that adequate provision is made for the future supply of aggregates to support planned housing construction, the national level of overall provision should be set at 130% of the historical sales figure. The latter, as noted above, has been calculated as 15.557 mtpa. Applying a 30% uplift to this figure thus gives a **headline, national figure for future primary, land-won aggregates provision is calculated to be 20.224 mtpa**.

5.8 This figure is only marginally higher than the actual recorded sales total of 20.11mt for the year 2007 at the start of the baseline period, immediately prior to the economic recession, so is demonstrably not an unreasonable figure.

STAGE 2: Calculation of the Regional Split between North Wales and South Wales

5.9 Table 3.1, in Chapter 3, shows how the regional split of primary aggregate sales between North Wales and South Wales has varied only slightly over the baseline period, ranging from 34/66% at one extreme to 41/59% at the other. Over the period as a whole, the average split (calculated from the more detailed and updated figures in Tables 5.2 to 5.5, below) has been **38.26**% / **61.74**%

5.10 Applying this ratio to the national total from para. 5.7 above gives the following headline apportionments for each of the two regions:

- **North Wales primary land-won aggregates**: **7.738 mtpa**
- **South Wales primary land-won aggregates**: **12.486 mtpa**

STAGE 3: Calculation of Sub-Regional and LPA Apportionments

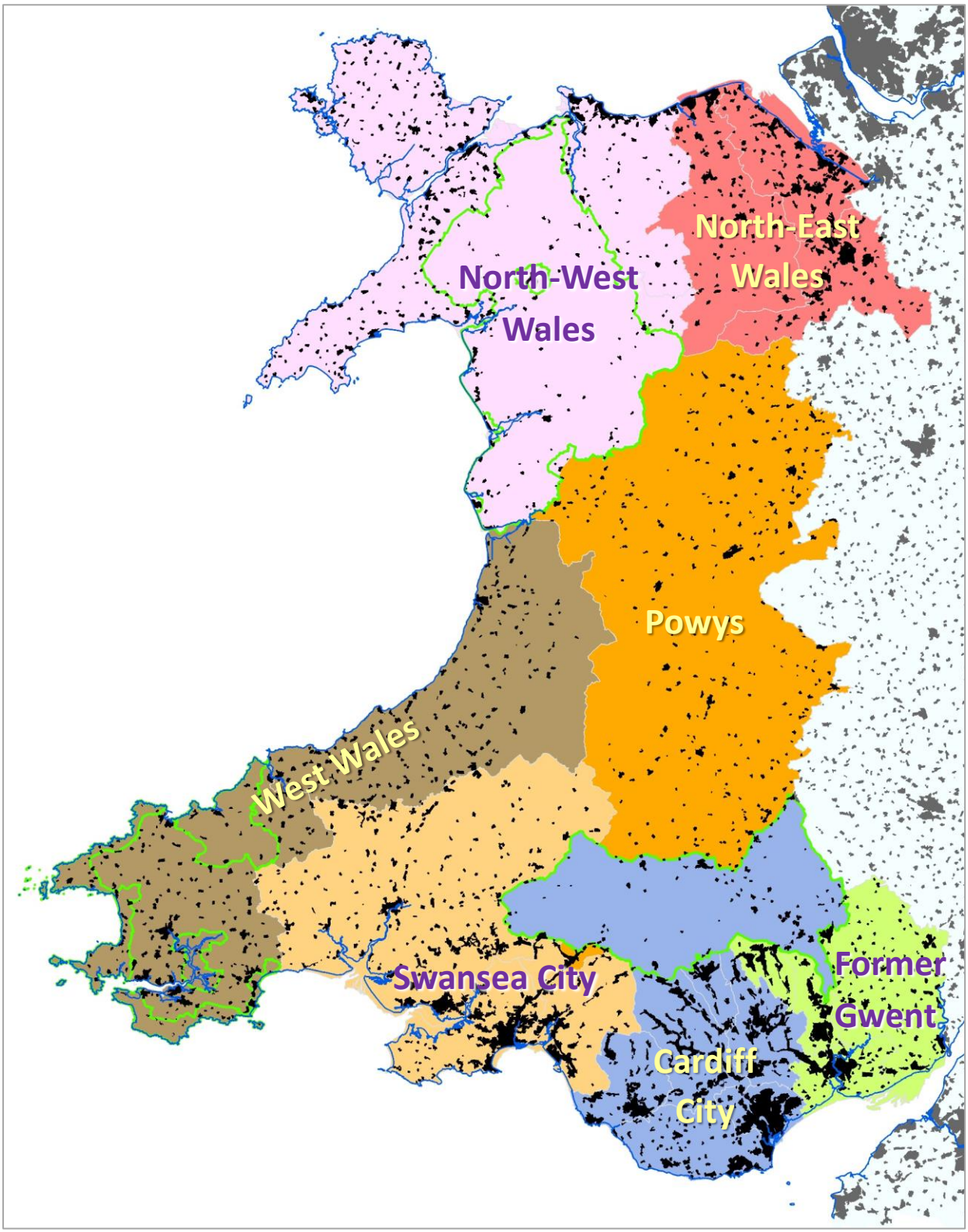
5.11 Stage 3 of the apportionment process requires that the regional figures are apportioned between a series of seven **sub-regions**, created for the purpose of the RTS and, *provided that it is feasible to do so*, between each of the constituent Local Planning Authorities (LPAs).

5.12 The sub-regions were created, at Welsh Government's suggestion, for the specific purpose of facilitating strategic minerals planning and collaborative approaches between LPAs. They each represent distinctive 'market areas' between which there is relatively little movement of aggregates, except for exports to England, and within which detailed, strategic consideration can be given as to the most appropriate patterns of supply.

5.13 The sub-regions, as listed below, are illustrated in Figure 5.2, which also shows (in black), the main urban areas and (in shades of grey) the neighbouring authorities in England.

- **North West Wales** (comprising Anglesey, Gwynedd, Conwy and the Snowdonia National Park), and
- **North East Wales** (comprising Denbighshire, Flintshire & Wrexham);
- **Powys**;
- **West Wales** (Pembrokeshire, Pembrokeshire Coast National Park and Ceredigion);
- **Swansea City-Sub-Region** (Swansea, Neath Port Talbot and Carmarthenshire);
- **Cardiff City Sub-Region** (Cardiff, RCT, Merthyr Tydfil, Caerphilly, Bridgend, the Vale of Glamorgan and the Brecon Beacons National Park); and
- **'Former Gwent'** (Blaenau Gwent, Torfaen, Newport and Monmouthshire).

Figure 5.2: Sub-Regional Groupings of Local Planning Authorities in Wales, as determined for the purposes of land-won primary aggregate apportionment



5.14 The sub-regional groupings, thus defined, provide the basis for dividing the Regional Apportionment figures (from para 5.10, above), between the various groups of LPAs and, where feasible, between individual LPAs. The methodology for doing this, as

agreed by the RTS Steering Group, was based on a combination of quantitative calculations and qualitative judgements, as described below.

5.15 Dealing first with the **quantitative data**, it was agreed that the apportionments should reflect, not only the pattern of historical sales (as had been used in the First Review) but also, where necessary, the pattern of planned future housing construction[16], for consistency with the concept of integrated planning policy, introduced in Chapter 3 (see para. 3.3). This would have the added benefit of introducing changes to the supply pattern so that it becomes more aligned with the spatial pattern of likely demand, thereby addressing some of the inequalities that are reflected in the existing (historical) pattern of supply.

5.16 Two sets of 'theoretical' figures were therefore produced, one relating to historical sales ("Option A") and one relating to the housing figures ("Option B"). The term 'theoretical' is used here to indicate that these are the figures that would result from using only one or the other of the two datasets.

5.17 The historical sales data for Option A are derived from Table 3.2, above, using the highest of the 10-year and 3-year averages, for each LPA. In Tables 5.2 and 5.3 below, those figures are then expressed as percentages of the Regional totals and applied to the appropriate Regional figures from Stage 2, above, to obtain the Option A figures shown on the left hand side of the tables.

5.18 For Option B, the annualised housing requirements data for each LPA, taken from Table 3.3, were initially expressed as percentages of the Regional housing requirement totals, in a similar way to the analysis of sales data for Option A. However, applying those percentages to the Regional apportionments from Stage 2 resulted in theoretical LPA figures which were felt to be too far removed from the 'reality' of the historical supply pattern. Instead, the process was therefore taken down to the sub-regional level: the housing figures were expressed as percentages of the sub-regional housing totals and applied to the sub-regional apportionment totals obtained from Option A, to give the Option B figures shown in columns 5 to 7 of Tables 5.2 and 5.3. For the purpose of this exercise (only), the two sub-regions in south-east Wales (i.e. Cardiff and Former Gwent) were combined. This was to address the fact that Former Gwent, as a whole, is considered, by the Steering Group, to have been making a relatively limited contribution to the overall supply pattern for many years.

5.19 Option A has the advantage of reflecting the existing distribution of supply sources (quarries) and is therefore realistic in terms of 'deliverability' but carries the disadvantage of perpetuating the historical supply pattern and the inequalities contained therein. It represents the preferred option in areas where the historical supply pattern appears to provide a sensible balance between the availability of resources and the location of demand but requires modification elsewhere.

[16] As noted earlier, the data used here relates specifically to housing **requirements**, as objectively assessed for each LPA, rather than the figures for housing **provision** adopted in LDPs, which are usually higher, following the inclusion of variable allowances in each LPA for 'flexibility'. The requirement figures were agreed, at a meeting of the two RAWPs, in July 2019, to be a more reliable basis for analysis.

Table 5.2: Assessed Sub-Regional and LPA Apportionments, North Wales.

Local Planning Authority	OPTION A: highest of 10-yr and 3yr Ave. Aggregate Sales (total) (mtpa)	OPTION A: % share of Regional total	OPTION A: Resulting Annualised Apportionments for all Land-Won Primary Aggregates[1] (mtpa)	OPTION B: Annualised Future Housing Requirement from Local Plans	OPTION B: % share of Sub-Regional total	OPTION B: Resulting Annualised Apportionments for all Land-Won Primary Aggregates[2] (mtpa)	Preferred Annualised Apportionments (mtpa) [By default = Option A, but modified in some cases (red figures) to allow for Option B or qualitative observations as noted in column to right]	Qualitative Observations
N. WALES TOTAL (from Stage 2)				**7.738**				
NE Wales Sub-Region	**4.047**	**65.75%**	**5.088**	**1,480**	**100.00%**	**5.088**	**5.088**	**The existing supply pattern here (Option A) provides an appropriate balance between market forces (including substantial exports) and the availability of unconstrained resources.** Flintshire has much higher aggregate sales than Denbighshire, despite similar housing requirements. This reflects local market distortion by exports to NW England. The slight modification shown within the preferred apportionment figures is to make the best use of existing landbanks and thereby reduce future allocation requirements overall. Wrexham supplies only sand & gravel as its limestone resources are largely constrained by the AONB.
Denbighshire	0.329	5.35%	0.414	500	33.78%	1.719	0.860	
Flintshire	3.204	52.06%	4.028	463	31.28%	1.592	3.582	
Wrexham	0.514	8.35%	0.646	517	34.93%	1.777	0.646	
NW Wales Sub-Region	**2.108**	**34.25%**	**2.650**	**969**	**100.00%**	**2.650**	**2.650**	**The existing supply pattern in NW Wales is well balanced with the distribution of planned housing provision and is unaffected by exports**. Option A should therefore be used. Supplies are sourced primarily from outside the National Park and AONBs and are well distributed between the main producing areas of Conwy and Gwynedd, with more limited supplies from Anglesey to local markets.
Conwy + Snowdonia NP	0.955	15.52%	1.201	490	50.57%	1.340	1.201	
Gwynedd	0.898	14.59%	1.129	479	49.43%	1.310	1.129	
Isle of Anglesey	0.255	4.14%	0.321				0.321	

Notes:

1. The annualised apportionments for Option A were obtained by applying the percentages in column 3 (representing each LPA's share of Regional historic sales totals) by the Regional Apportionment total from Stage 2 (as shown at the top of the table).
2. The annualised apportionments for Option B were obtained by applying the percentages in column 6 (representing each LPA's share of sub-regional housing requirement totals) by the corresponding Sub-regional Apportionment totals from column 4.

Table 5.3: Assessed Sub-Regional and LPA Apportionments, South Wales.

Local Planning Authority *(see Table 5.2 for footnotes)*	OPTION A: highest of 10-yr and 3yr Ave. Aggregate Sales (total) (mtpa)	OPTION A: % share of Regional total	OPTION A: Resulting Annualised Apportionments for all Land-Won Primary Aggregates[1] (mtpa)	OPTION B: Annualised Future Housing Requirement from Local Plans	OPTION B: % share of Sub-Regional total	OPTION B: Resulting Annualised Apportionments for all Land-Won Primary Aggregates[2] (mtpa)	Preferred Annualised Apportionments (mtpa) [By default = Option A, but modified in some cases (red figures) to allow for Option B or qualitative observations as noted in column to right]	Qualitative Observations
S. WALES TOTAL (from Stage 2)				**12.486**				
West Wales Sub-Region	**1.140**	**12.13%**	1.514	**887**	**100.00%**	1.514	**1.514**	**Some adjustment is required to increase the provision from Ceredigion whilst reducing that from the Pembrokeshire Coast National Park but leaving the total unchanged**. Ceredigion currently supplies aggregates in proportion to its share of planned housing at a regional level, but not at the sub-regional level. Provision from this LPA should therefore be increased (to an average of Options A and B), with a corresponding reduction from the National Park.
Ceredigion	0.300	3.19%	0.398	400	45.10%	0.683	0.541	
Pembrokeshire	0.510	5.42%	0.677	487	54.90%	0.831	0.677	
Pembrokeshire Coast NP	0.330	3.51%	0.438				0.296	
Swansea Sub-Region	**1.292**	**13.74%**	1.716	**2,573**	100.00%	1.716	**1.716**	**The Option A figure for Carmarthenshire should be retained, with the remainder of production (mostly HSA - high PSV sandstone) being divided between Swansea and NPT.** Option B addresses the current zero apportionment for Swansea, but realistic opportunities for resource development in Swansea relate only to high PSV sandstone which, at present, is supplied primarily from NPT. Limestone is supplied only from Carmarthenshire, which therefore needs to retain its apportionment from Option A in full, with the balance of apportionments (for sandstone) being shared between Swansea and NPT. The figures shown here for those two LPAs assume an equal split between them. If a different balance is preferred, this would need to be agreed by those LPAs as part of their Sub-Regional Statement of Collaboration.
Carmarthenshire	0.832	8.85%	1.105	1,013	39.37%	0.676	1.105	
Swansea	0.000	0.00%	0.000	1,040	40.42%	0.694	0.305	
Neath Port Talbot	0.460	4.89%	0.611	520	20.21%	0.347	0.305	
Powys Sub-Region	**2.650**	**28.19%**	3.519	**300**	**100.00%**	3.519	**3.519**	**Option A provides the most reliable reflection of future demand for Powys, being dominated, as it is, by exports of HSA (high PSV) Aggregates to England. That option is therefore preferred without modification**
Powys	2.650	28.19%	3.519	300	100.00%	3.519	3.519	

Continued …

.....Table 5.3 continued	**OPTION A**			**OPTION B**			**Preferred Annualised Apportionments** (mtpa) [By default = Option A, but modified in some cases (red figures) to allow for Option B or qualitative observations as noted in column to right]	**Qualitative Observations**
Local Planning Authority *(see Table 5.2 for footnotes)*	**highest of 10-yr and 3yr Ave. Aggregate Sales (total)** (mtpa)	**% share of Regional total**	**Resulting Annualised Apportionments for all Land-Won Primary Aggregates[1]** (mtpa)	**Annualised Future Housing Requirement from Local Plans**	**% share of Sub-Regional total** *(or of combined SE Wales total, for Cardiff & Former Gwent)*	**Resulting Annualised Apportionments for all Land-Won Primary Aggregates[2]** (mtpa)		
Cardiff City Sub-Region	**4.070**	**43.29%**	**5.405**	**5,063**	76.72%	**4.402**	**4.903**	ALL of the apportionments within the combined SE Wales area (i.e. the Cardiff sub-region and Former Gwent) need to be adjusted to reflect the fact that Former Gwent, as a whole, has not been supplying its fair share of aggregates for many years (this being largely but not only due to the lack of production in both Torfaen and Newport). Option B addresses this issue by calculating requirements based on % shares of planned housing demand in both sub-regions combined. However, those figures, on their own, do not take account of resource availability. **For most LPAs, the preferred figure is therefore the average of Options A and B.** In the case of BBNP and Merthyr, where that calculation provides only a combined figure (= 0.581mtpa), it is suggested that Merthyr should retain the Option A figure of 0.199mtpa, with the balance of 0.382mtpa being assigned to the National Park. The figures shown for the Former Gwent LPAs are simply averages of Options A and B. Torfaen and Newport currently have zero apportionments and the feasibility of being able to make future provision in those areas needs to be examined in greater detail by those Authorities. If the balance of supply needs to depart from these figures (but without reducing the sub-regional total), this would need to be agreed by all four LPAs as part of their Sub-Regional Statement of Collaboration.
Brecon Beacons NP	0.540	5.74%	0.717	283	4.29%	0.246	0.382	
Merthyr Tydfil	0.150	1.60%	0.199				0.199	
Bridgend	0.600	6.38%	0.797	544	8.24%	0.473	0.635	
Rhondda Cynon Taf	0.670	7.13%	0.890	959	14.53%	0.834	0.862	
Vale of Glamorgan	0.660	7.02%	0.876	631	9.56%	0.549	0.713	
Caerphilly	0.390	4.15%	0.518	575	8.71%	0.500	0.509	
Cardiff	1.060	11.27%	1.408	2,071	31.38%	1.800	1.604	
Former Gwent Sub-Region	**0.250**	**2.66%**	**0.332**	**1,536**	23.28%	**1.335**	**0.834**	
Blaenau Gwent	0.180	1.91%	0.239	233	3.53%	0.203	0.221	
Monmouthshire	0.070	0.74%	0.093	300	4.55%	0.261	0.177	
Newport	0.000	0.00%	0.000	690	10.46%	0.600	0.300	
Torfaen	0.000	0.00%	0.000	383	5.18%	0.281	0.140	

5.20 Option B, based purely on the distribution of planned housing activity, theoretically provides a way of changing the pattern of supply to one that is more equitable, and in line with the distribution of a very significant element of demand (i.e. house building and associated other construction), but takes no account of the spatial pattern of geological resources or existing quarries. On its own, this would be wholly inappropriate as a future supply strategy as it would not be deliverable within the timescale required, since it requires supplies to be provided from areas with no existing quarries. It does, however, provide a useful indication of the 'direction of travel' that may be needed in order to improve the existing pattern of supply from a sustainability perspective.

5.21 In practice, where the supply pattern was considered to be in need of adjustment to achieve an improved balance, the two sets of figures were combined (by taking the average of Options A and B, for each LPA). In each of the tables, the **preferred option** (usually either option A or the average of A and B) are shown in the eighth column. In a few cases, however, further adjustments were required on the basis of more nuanced **qualitative judgements**, as described in the right-hand column of the tables.

5.22 Decisions regarding which option to select for each LPA, and qualitative judgements regarding other factors which needed to be taken into account, were made by the RTS Steering Group through a process of round-table discussion. Importantly, the analysis and discussions were focused on each of the self-contained sub-regional areas in turn, so as to achieve a preferred balance of supply within each of those areas, whilst not disturbing the broader-scale pattern of supply within each Region as a whole. The only exception to this was in South-East Wales where, as noted earlier, the two sub-regions (Cardiff and Former Gwent) were combined for the quantitative stage of analysis.

5.23 The summaries given in the right hand column of Tables 5.2 and 5.3 describe the main reasoning for selecting the preferred distribution of apportionments within each sub-region. Fuller explanations, including details of the consideration given to the distribution of resources, practicalities of mineral extraction, major constraints (National Parks and AONBs), environmental capacity and the proximity principle, are given within the Regional Appendices.

STAGE 4: Sand & Gravel / Crushed Rock Split and Allocations for Future Working

5.24 The final stage of the RTS process relates to the separation of each LPA's apportionment figure by aggregate type (i.e. natural sand & gravel, and crushed rock), and then comparison of the total requirements for each of those, over the relevant Plan periods, with the current stock of permitted reserves, in order to determine whether or not new allocations are required to meet any shortfalls. Tables 5.4 to 5.7 below present the data and calculations involved.

Table 5.4: Calculation of Allocations Required for Land-won Sand & Gravel Aggregates – North Wales

Local Planning Authority	Overall 'Preferred' Apportionment (S&G & CR)[1] (mt)	Historic proportion supplied from sand & gravel sources[2]	New Annualised Apportionment for sand & gravel[3] (mt)	Total Apportionment Required over 22 years	Existing permitted reserves at end of 2016 in mt[4, 5]	Existing landbank[6] (years)	Surplus or Shortfall (-) of Existing Permitted Reserves (mt)	Minimum Allocation needed to meet Required Provision[7] (mt)	Additional reserves at Dormant sites, 2016[4] (mt)
Denbighshire	0.860	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Flintshire	3.582	6.23%	0.223	4.912	1.369	6.1	-3.543	3.543	0.5
Wrexham	0.646	100.00%	0.646	14.217	12.652	19.6	-1.565	1.565	0
Conwy + Snowdonia NP	1.201	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Gwynedd	1.129	15.44%	0.174	3.834	1.175	6.7	-2.659	2.659	0
Isle of Anglesey	0.321	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Sub-totals, North Wales	**7.738**	**13.40%**	**1.044**	**22.963**	**15.196**		**-7.767**	**7.767**	**0.5**

NOTES:

1 Taken from Tables 5.2 (North Wales) or Table 5.3 (South Wales)

2 Based on RAWP data over the 10-year baseline period (2007 – 2016)

3 Assumes that the historic proportion is maintained.

4 Data provided by the RAWP secretary for December 2016

5 Permitted reserves exclude those at dormant sites.

6 Landbanks = stock of permitted reserves at active and inactive sites, expressed in terms of the annualised apportionment

7 Allocations required = calculated shortfall, if any.

8. The sand & gravel allocations needed for Ceredigion could potentially be provided, in part, from neighbouring parts of Carmarthenshire, despite being in a different sub-region.

Where allocation requirements are shown these are the minimum amounts required to meet the RTS requirements. In many cases an application for an individual new permission will exceed these amounts, in the interests of economic viability. Such applications should not be rejected purely on the grounds of exceeding the minimum requirements shown here. In some cases, the suggested allocations may already have been partially or entirely fulfilled, either by new permissions granted since 2016, or by allocations that have already been identified in LDPs. Further details are given in the Regional Appendices.

Table 5.5: Calculation of Allocations Required for Land-won Sand & Gravel Aggregates – South Wales.

Local Planning Authority *see Table 5.4 for footnotes	Overall 'Preferred' Apportionment (S&G & CR)[1] (mt)	Historic proportion supplied from sand & gravel sources[2]	New Annualised Apportionment for sand & gravel[3] (mt)	Total Apportionment Required over 22 years	Existing permitted reserves at end of 2016 in mt[4, 5]	Existing landbank[6] (years)	Surplus or Shortfall (-) of Existing Permitted Reserves (mt)	Minimum Allocation needed to meet Required Provision[7] (mt)	Additional reserves at Dormant sites, 2016[4] (mt)
Ceredigion	0.541	36.67%	0.198	4.361	0.510	2.6	-3.851	3.851	0
Pembrokeshire	0.677	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Pembrokeshire Coast NP	0.296	36.36%	0.108	2.368	2.600	24.2	0.232	0.000	0
Carmarthenshire	1.105	0.24%	0.003	0.058	0.100	37.7	0.042	See note 8	0.35
Swansea	0.305	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Neath Port Talbot	0.305	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Powys	3.519	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Brecon Beacons NP	0.381	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Merthyr Tydfil	0.200	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Bridgend	0.635	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Rhondda Cynon Taf	0.862	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Vale of Glamorgan	0.713	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Caerphilly	0.509	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Cardiff	1.604	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Blaenau Gwent	0.221	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Monmouthshire	0.177	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Newport	0.300	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Torfaen	0.136	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Sub-totals, South Wales	**12.486**	**2.96%**	**0.308**	**6.787**	**3.21**			**3.851**	**0.35**
TOTALS Wales	**20.224**	**6.95%**	**1.352**	**29.750**	**18.406**			**11.618**	**0.85**

Table 5.6: Calculation of Allocations Required for Crushed Rock Aggregates – North Wales.

Local Planning Authority	Overall 'Preferred' Apportionment (S&G & CR)[1] (mt)	Historic proportion supplied from crushed rock sources[2]	New Annualised Apportionment for crushed rock[3] (mt)	Total Apportionment Required over 25 years	Existing permitted reserves at end of 2016 in mt[4, 5]	Existing landbank[6] (years)	Surplus or Shortfall (-) of Existing Permitted Reserves (mt)	Minimum Allocation needed to meet Required Provision[7] (mt)	Additional reserves at Dormant sites, 2016[4] (mt)
Denbighshire	0.860	100.00%	0.860	21.500	21.710	25.2	0.210	0.000	0
Flintshire	3.582	93.77%	3.359	83.968	48.040	14.3	-35.928	35.928	1.41
Wrexham	0.646	0.00%	0.000	0.000	0.000	n/a	0.000	0.000	0
Conwy + Snowdonia NP	1.201	100.00%	1.201	30.016	62.500	52.1	32.484	0.000	0.25
Gwynedd	1.129	84.56%	0.955	23.867	28.540	29.9	4.673	0.000	0
Isle of Anglesey	0.321	100.00%	0.321	8.015	14.400	44.9	6.385	0.000	0
Sub-totals, North Wales	**7.738**	**86.60%**	**6.695**	**167.366**	**175.19**			**35.928**	**1.66**

NOTES:

1 Taken from Tables 5.2 (North Wales) or Table 5.3 (South Wales)

2 Based on RAWP data over the 10-year baseline period (2007 – 2016)

3 Assumes that the historic proportion is maintained.

4 Data provided by the RAWP secretary for December 2016

5 Permitted reserves exclude those at dormant sites.

6 Landbanks = stock of permitted reserves at active and inactive sites, expressed in terms of the annualised apportionment

7 Allocations required = calculated shortfall, if any.

Where allocation requirements are shown these are the minimum amounts required to meet the RTS requirements. In many cases an application for an individual new permission will exceed these amounts, in the interests of economic viability. Such applications should not be rejected purely on the grounds of exceeding the minimum requirements shown here. In some cases, the suggested allocations may already have been partially or entirely fulfilled, either by new permissions granted since 2016, or by allocations that have already been identified in LDPs. Further details are given in the Regional Appendices.

Table 5.7: Calculation of Allocations Required for Crushed Rock Aggregates – South Wales.

Local Planning Authority *see Table 5.6 for footnotes	Overall 'Preferred' Apportionment (S&G & CR)[1] (mt)	Historic proportion supplied from crushed rock sources[2]	New Annualised Apportionment for crushed rock[3] (mt)	Total Apportionment Required over 25 years (30 years in Cardiff)	Existing permitted reserves at end of 2016 in mt[4, 5]	Existing landbank[6] (years)	Surplus or Shortfall (-) of Existing Permitted Reserves (mt)	Minimum Allocation needed to meet Required Provision[7] (mt)	Additional reserves at Dormant sites, 2016[4] (mt)
Ceredigion	0.541	63.33%	0.342	8.559	5.370	15.7	-3.189	3.189	0
Pembrokeshire	0.677	100.00%	0.677	16.932	16.720	24.7	-0.212	0.212	0
Pembrokeshire Coast NP	0.296	63.64%	0.188	4.709	10.370	55.1	5.661	0.000	0
Carmarthenshire	1.105	99.76%	1.102	27.556	59.900	54.3	32.344	0.000	13.82
Swansea	0.305	n/a	0.305	7.636	0.000	0.0	-7.636	7.636	0
Neath Port Talbot	0.305	100.00%	0.305	7.636	16.480	54.0	8.844	0.000	0
Powys	3.519	100.00%	3.519	87.981	139.240	39.6	51.259	0.000	0
Brecon Beacons NP	0.381	100.00%	0.381	9.525	120.100	206.7	105.575	0.000	0.36
Merthyr Tydfil	0.200	100.00%	0.200	5.000					
Bridgend	0.635	100.00%	0.635	15.872	27.270	43.0	11.398	0.000	0.15
Rhondda Cynon Taf	0.862	100.00%	0.862	21.544	9.830	11.4	-11.714	11.714	0
Vale of Glamorgan	0.713	100.00%	0.713	17.813	18.730	26.3	0.917	0.000	13
Caerphilly	0.509	100.00%	0.509	12.723	31.280	61.5	18.557	0.000	5.21
Cardiff	1.604	100.00%	1.604	48.123	27.800	17.3	-20.323	20.323	0
Blaenau Gwent	0.221	100.00%	0.221	5.520	1.320	6.0	-4.200	4.200	0
Monmouthshire	0.177	100.00%	0.177	4.422	11.250	63.6	6.828	0.000	0
Newport	0.300	n/a	0.300	7.498	0.000	0.0	-7.498	7.498	0
Torfaen	0.136	n/a	0.136	3.401	0.000	0.0	-3.401	3.401	0
Sub-totals, South Wales	**12.486**	**97.04%**	**12.177**	**312.45**	**495.66**			**58.173**	**32.54**
TOTALS Wales	**20.224**	**93.05%**	**18.872**	**479.816**	**670.850**			**94.101**	**34.20**

5.25 The requirements, as set out in paragraph 49 of MTAN1, are that a minimum 10 year landbank of crushed rock and a minimum 7 year landbank for sand and gravel should be maintained throughout the entire plan period of each LDP. In effect, this means having a minimum landbank for sand & gravel of 22 years, at the start of a 15-year Plan period, and a minimum crushed rock landbank of 25 years[17]. In each case, the landbank is required, by MTAN 1 to be based on an average of the most recent 3 years' production figures. That was modified, in the RTS First Review, to be based on an average of 10-years production figures, since that was adopted as the main guide for future levels of demand. For the present review, a further modification is needed, such that the landbank is expressed in terms of the annualised apportionment figure agreed for each LPA. In all cases, these are higher than the 10-year or 3-year historical sales averages, and the landbanks are therefore correspondingly reduced, increasing the likelihood for new allocations being required. It must be emphasised, however, that, at the start of any given Plan period, the overall provision (total apportionment) can be represented by a combination of existing landbanks of permitted reserves and (where necessary) new allocations.

Sand & Gravel / Crushed Rock Aggregates Split

5.26 In order to carry out the necessary calculations, it was necessary first to distinguish between natural sand & gravel and crushed rock requirements. To do this, it has been assumed that the new apportionments will be divided between the two aggregate types in the same ratio as shown by the historical sales data, over the 10-year baseline period.

5.27 Theoretically, there may sometimes be opportunities to achieve the overall requirements with a different balance of aggregate types – for example where there is a surplus of permitted crushed rock reserves but a shortage of sand & gravel. In practice, however, this combination of circumstances occurs in only one LPA – Gwynedd. Even in that area, the substitution may not be appropriate, depending on the particular end-uses involved. The reverse situation, where there are surpluses of permitted sand & gravel reserves, is found in only two areas –The Pembrokeshire Coast National Park and Carmarthenshire. In both areas, although there is a small surplus of sand & gravel, there are much larger surpluses of crushed rock, so no necessity for substitution to occur.

Surpluses, Shortfalls and Allocations

5.28 For **land-won sand & gravel**, Tables 5.4 and 5.5 reveal that new allocations to meet RTS requirements over the next 22 years will be required within Flintshire, Wrexham, Gwynedd and Ceredigion. Current landbanks, expressed in terms of the new annualised apportionments, are already less than the minimum level of 7 years in three of these areas, demonstrating the urgency for granting new permissions, as well as longer-term allocations for future working. In the fourth area (Wrexham),

[17] Except in Cardiff, which has a 20-year Plan period and thus is required to have a 30-year landbank of crushed rock at the start of that period

the landbank is currently adequate, at just under 20 years, but a further allocation is needed to meet the RTS requirement over the full plan period.

5.29 Only two LPAs in the whole of Wales (Pembrokeshire Coast National Park and Carmarthenshire) currently have a surplus of existing permitted reserves of sand & gravel. The remaining LPAs have neither a surplus nor deficit for sand & gravel provision but, in all cases, this is simply because they currently have no production and no apportionment. In South East Wales, this position is critically dependent upon the continued availability of marine-dredged aggregates. If that source of supply were to be disrupted, there would be an urgent need to reconsider the apportionments to all of the authorities in that area.

5.30 For **crushed rock**, Tables 5.6 and 5.7 reveal that many parts of Wales already have substantial permitted reserves of crushed rock, with landbanks in excess of the required minimum of 25 years. However, shortfalls of permitted reserves, with corresponding requirements for new allocations and/or new permissions, are identified in nine separate LDP areas.

5.31 Three of these (Swansea, Newport and Torfaen) correspond to the areas which previously had zero apportionments, and where new sources of supply now need to be found, either within those areas or in neighbouring parts of the same sub-regions (subject to the statements of sub-regional collaboration with the other LPAs). In the case of Swansea, the reserves requirement (specifically for HSA (high PSV) sandstone) could theoretically be subsumed within the surplus available in adjoining Neath Port Talbot, though that would defeat the objective of seeking a more equitable sub-regional balance. For Newport and Torfaen, most of their combined requirement of more than 10.9 million tonnes could be offset by the surplus of 6.83 million tonnes in Monmouthshire, although that would still leave a slight deficit and again would defeat the objective of seeking a more equitable balance.

5.32 The six other LPAs with shortfalls of permitted crushed rock reserves are Flintshire, Ceredigion, Pembrokeshire, Rhondda Cynon Taf, Cardiff and Blaenau Gwent. In Pembrokeshire, the shortfall is modest – only 0.212 million tonnes – and could arguably be combined with the requirement in Ceredigion within the same sub-region.

5.33 In the case of RCT and the Cardiff, the combined shortfall of more than 32mt is dwarfed by the net surplus of almost 105 mt within the Cardiff City sub-region as a whole, though most of that lies within the Brecon Beacons National Park. The shortfall in RCT is almost matched by the surplus in Bridgend, whilst that in Cardiff is almost matched by the surplus in Caerphilly. Once again, however, to rely on those reserves would defeat the objective of seeking a more sustainable long-term pattern of supply, and the new allocations should therefore be sought.

5.34 The remaining LPA facing a shortfall of permitted crushed rock reserves – Blaenau Gwent – falls within the same 'Former Gwent' sub-region as Torfaen and Newport and is therefore already facing competition from those authorities for any potential share of surplus permitted reserves in Monmouthshire. Moreover, the reserves in

Monmouthshire are bound up in a single site which has been inactive for many years and some of them, at least, could only be accessed by dewatering the Carboniferous Limestone aquifer.

Types of Allocation

5.35 In each case, where sufficiently detailed information exists, it is recommended that the allocations should ideally take the form of **Specific Sites**, as defined in Paragraph 5.14.19 of Planning Policy Wales (PPW) i.e. *"where mineral resources of commercial significance exist, and where any planning applications which come forward for those sites are likely to be acceptable in planning terms".* Where that is not possible, they should normally at least take the form of **Preferred Areas** *("areas of known resources with some commercial potential, and where planning permission might reasonably be anticipated")*, within which operators should be encouraged to bring forward more specific proposals.

5.36 A key requirement is to be able to demonstrate, within the LDP, that adequate provision has been made and this, in turn, means that the quantity of workable mineral within the allocation needs to be known, as far as possible. In most cases, this is only likely to be feasible within Specific Sites. Preferred Areas will generally not have sufficient information to be able to do this, though it may sometimes be possible for reasonable estimates to be made. **Areas of Search** ("…*broad areas that are believed to contain mineral resources of commercial significance but whose extent is uncertain…*") will usually have only minimal information on the suitability and commercial viability of the resources for commercial development and, as noted in PPW, it will not usually be appropriate to only rely on these for the purposes of making allocations.

5.37 There will be some situations, however, where there is insufficient knowledge about potential resources to identify anything other than Areas of Search. Where this is the case, it is recommended that the Area(s) so identified should provide the potential for the release of new permitted reserves which are far greater than the minimum allocation recommended, in order to allow for the uncertainties involved. In some cases, it may be better, in terms of deliverability, to rely on specific sites (whether existing permissions or new allocations) in neighbouring authorities (additional to those LPAs' own requirements), where such reliance has been agreed through collaborative working, in preference to relying upon the uncertainty associated with broad Areas of Search.

Treatment of Dormant Sites

5.38 As noted in Chapter 2 (para. 2.4), where an LPA considers that the permitted reserves at dormant sites are likely to be capable of being worked in the relevant period (subject to Environmental Impact Assessment and the agreement of modern conditions) it may be possible for those reserves to be offset against the requirement for new allocations. This would only work, however, if the sites in question meet the same expectations as for other allocations, i.e. that they comply with the definition of Specific Sites or at least Preferred Areas, as given in PPW.

Compliance with and Departures from RTS Recommendations

5.39 Finally, it should be noted that the recommendations made in this Chapter are based on currently available information regarding permitted reserves, production, proximity and environmental capacity. As noted in 'Box 1' of the original RTS documents, and repeated in the First Review, the suggested apportionments and allocations do not take fully into account all factors that may be material to the ensuring an adequate supply of aggregates obtained from appropriately located sources. Such factors may, *inter alia*, include such things as:

- The technical capability of one type of aggregate to interchange for another;
- The relative environmental cost of substitution of one type of aggregate by another;
- The relative environmental effects of changing patterns of supply; and
- Whether adequate production capacity can be maintained to meet the required level of supply.

5.40 For such reasons, and as already noted in Chapter 1 (para. 1.27), where it is justified by new evidence, it is open for individual LPAs to depart from the apportionment and allocation figures recommended by the RTS. In doing so, however, an LPA would need to demonstrate that their intended departure would not undermine the overall strategy provided by the RTS itself (e.g. by working together with other LPAs to ensure that sub-regional and regional totals are still achieved) and this would be likely to become a key issue at Examination and/or Public Inquiry. To reinforce that concept, this Review of the RTS introduces a new requirement for all LPAs within each sub-region to agree a Sub-Regional Statement of Collaboration, and for this to be approved by the RAWP, prior to the Examination of any individual LDP within that area.

5.41 Where the local authorities involved are unable to reach agreement, or if individual local authorities do not accept the Regional Technical Statement, as a last resort the Welsh Government will consider its default powers to intervene in the LDP process, (MTAN 1, paragraph A3).

6. Consultation Process

6.1 Text to be added following the consultation exercise, similar to that contained in the First Review.

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Glossary

The following terms are frequently used in relation to aggregate supply and apportionment. The terms are listed in topic groupings rather than alphabetically.

Term	Definition, in relation to the supply of aggregates
TOPIC: Aggregate Materials	
Aggregate	Crushed rock, natural sand and gravel or artificial granular material that is used in construction, often in conjunction with a suitable binding agent such as bitumen or cement.
Primary Aggregates	Aggregates sourced directly from naturally occurring geological materials as a primary product (as distinct from secondary aggregates, including excavation wastes, produced as a by-product from the extraction or processing of geological materials for other primary purposes).
Secondary Aggregates	These are usually by-products of other industrial processes, or the arisings from non-aggregates extractive operations, that have been processed to meet the specification requirements for construction aggregate materials. They can be sub-divided into manufactured and natural materials, depending on their source. Examples of manufactured secondary aggregates are pulverised fuel ash (PFA) and metallurgical (iron and steel) slags. Natural secondary aggregates include china clay sand, ball clay sand, aggregate produced from slate waste or colliery spoil and excavation wastes (as defined below). All of these are exempt from the aggregates levy, giving them a deliberate cost advantage over primary materials, in an attempt to encourage their greater use.
Construction, Demolition and Excavation Wastes (CD&EW)	A term referring to wastes (see below) arising from the construction or demolition of buildings and/or civil engineering infrastructure, or from excavations associated with land levelling, foundations or other civil engineering works. Aggregates may be derived from some of these various waste streams, either as recycled materials or from excavation wastes (both of which are defined separately below).
Waste	Any substance or object which the holder discards or intends, or is required, to discard. In CD&EW surveys, materials arising from construction or demolition works, or from associated excavations, which are beneficially used *in an unprocessed form* on the site on which they arise are generally not regarded as waste, because they are not generally regulated as waste.
Road planings	A particular example of CD&EW materials, comprising aggregate and bituminous or cement binder materials that have been 'planed' from the surface of a worn out road prior to resurfacing with new or recycled materials.
Recycled Materials suitable for use as Aggregate	These are materials, usually arising from construction or demolition projects, which have previously been used for construction purposes, and which are capable of being recycled or re-used as construction aggregates for a second or further time. In the Finance Act 2001, all materials previously used in construction are exempt from the aggregates levy, giving them a deliberate cost advantage over primary aggregates in an attempt to encourage their greater utilisation.
Excavation Waste suitable for use as Aggregate	These are materials that may be suitable, with or without processing, for use as secondary aggregates, arising from excavation works: **a)** on the site of any building or proposed building, where the excavation is undertaken exclusively for the purposes of laying foundations, pipes or cables; **b)** on the site of any river, canal, watercourse or navigational channel, where the excavation is undertaken exclusively for the purpose of creating, restoring, improving or maintaining that feature; **c)** along the line or proposed line of any highway or proposed highway, where the excavation is undertaken for the purpose of constructing, improving or maintaining the highway and not wholly or mainly for the purpose of extracting aggregate. Each of these categories, as defined more precisely in the Finance Act 2001, is exempt from the aggregates levy, giving these materials a deliberate cost advantage over primary materials in an attempt to encourage their greater utilisation.
Mineral Wastes	Mineral wastes are identified in MTAN1 as a further category of material with potential for use as aggregate. The term is specifically used to encompass aggregates from slate waste, colliery spoil, and crushed rock fines (i.e. the "dust" generated from crushing and screening operations in hard rock primary aggregate quarries). It may also include aggregates produced from the excavation and processing wastes at building stone (dimensional stone) quarries. Aggregates produced from slate waste and colliery spoil are classed as secondary materials (see above) and are exempt from the aggregates levy. The same is not true of crushed rock fines, or of the residue from building stone production, both of which remain classed as primary aggregates and are not exempt.

TOPIC: Supply and Demand	
Production	The overall rate at which products are generated, in tonnes (or millions of tonnes) per year, *whether or not they are sold*. In quarrying, production includes any unsaleable materials that may be produced, including overburden, interburden and processing waste, which may or may not be useable.
Sales	The rate at which products are sold, in tonnes (or millions of tonnes) per year. In quarrying, for the reasons outlined above, this will usually be less than the rate of production.
Consumption	The rate at which products are used, within a specified market area, measured in tonnes (or millions of tonnes) per year.
Demand	The need or desire for a product, backed by an ability to pay. Demand is measured over a given time period, and is affected by budgets, prices, preferences and the availability and price of alternative products. Demand for aggregates may be expressed in terms of the rate at which it is expected to be used within a particular market area (which is rarely known), or the rate at which it is expected to be supplied from a given source area, and is measured in tonnes (or millions of tonnes) per year.
Supply	The amount of a product which is supplied. Supply of aggregates is normally expressed in relation to a particular source area and is measured in tonnes (or millions of tonnes) per year.
Distribution	The pattern of market destinations served by the sales from a particular quarry or group of quarries.
Proximity Principle	The general concept of minimising the transportation of aggregates (and other bulk materials) by road, in accordance with para. 26 of MTAN1, in order to reduce associated impacts on the environment.

TOPIC: Resources, Reserves and Landbanks	
Resources (of primary aggregate)	Geological materials, including rocks and naturally occurring sand & gravel, which have the potential to be used as aggregates. The presence of a resource does not imply an acceptance of mineral working.
Permitted Reserves (of primary aggregate)	Primary aggregate resources which have the benefit of planning permission for the winning and working of minerals.
Landbank (of primary aggregate reserves)	In general, a landbank is a stock of planning permissions for the winning and working of minerals within a specified area, expressed both in millions of tonnes and in terms of the number of years' supply which they represent. The latter is usually calculated on the basis of recent rates of production.
Current Landbank (of permitted primary aggregate reserves)	In MTAN1 (paragraph 45), this is defined as *"the sum of all permitted reserves at active and inactive sites at a given time and for a given area"*, and is required to be based on *"the latest 3 years production figures"* (production, in this case, usually being represented by sales). **For the purposes of the RTS, and in the interests of adopting a more practical approach to the strategic planning of aggregates provision in Wales, two deliberate departures from this definition were agreed by the Steering Group at the time of the First Review**. Firstly, although 'inactive sites' technically include those which are dormant or suspended, the current landbank has been taken to exclude those sites (but see also 'Dormant Reserves' below). Secondly, in recognition of the prolonged economic recession, the agreed method of calculating the landbank has been to use the average of the latest 10 (rather than 3) years' sales figures.
Dormant Reserves	The permitted reserves of primary aggregates at Dormant sites (see below). MTAN1 (paragraph 47) requires these to be *"clearly shown in the landbank calculations as a separate category"*. For the purposes of this review, such reserves and those at sites where permission has been suspended (see below) have therefore been excluded from the main landbank calculations used to determine future allocation requirements, though in some cases they might be able taken into account by local authorities to offset any requirement for new allocations, subject to more detailed local knowledge.
Future Landbank (of primary aggregate reserves)*	In MTAN1 (paragraph 45), the Future (or 'Extended') Landbank is defined as *"land specifically allocated for the working of aggregates"* (but see footnote below*)
Apportionment	The rate for which the mineral planning system requires provision to be made, in Development Plans, for the supply of aggregates from a given area or region. This may be expressed either in terms of millions of tonnes over a specified period, and/or as an averaged 'annualised apportionment' in millions of tonnes per year.
Allocation	The identification, within a Local Development Plan, of an area of land for future mineral working. In Wales, the size (in terms of tonnage) of allocations required in specific LDPs are defined in the Regional Technical Statements, but only for areas in which the cumulative apportionments over the period covered by the RTS are in excess of the available landbank of permitted reserves, at the time of the baseline date used in the assessment (in this case 31/12/16).
Provision	The total amount of aggregate required to be supplied from a particular local authority over the duration of its Local Development Plan. The overall provision may comprise both a landbank of permitted reserves and allocations for future working.

* The term 'Future Landbank' is somewhat confusing, since a landbank is a stock of planning permissions and (by definition), allocations do not have this status. Allocations may thus form part of the overall 'provision' within a Local Development Plan, but cannot form part of the landbank.

TOPIC: Quarry Status	
Active Site	Active sites in Wales are explicitly defined by the Town and Country Planning (Fees for Applications and Deemed Applications) (Amendment No.2) (Wales) Regulations 2006 as sites where *"**a)** development to which the relevant mineral permission or landfill permission relates is being carried out to any substantial extent; or **b)** other works to which a condition attached to such permission are being carried out to any substantial extent".* "Substantial extent" is not defined, but relevant guidance is provided in Minerals Planning Guidance Note 14 (MPG14): Environment Act 1995:- Review of Mineral Planning Permissions.
Inactive Site	Defined by the Town and Country Planning (Fees for Applications and Deemed Applications) (Amendment No.2) (Wales) Regulations 2006 as one *"which is not an active site",* as defined above. Inactive sites thus include, but are not limited to, those which are classified under the Environment Act 1995 as being dormant and those where planning permission has been suspended (see below).
Dormant Site	As defined in the Environment Act 1995, this refers specifically to quarries with mineral permissions granted between 30th June 1948 and 22nd February 1982 (i.e. "Phase I" and "Phase II" sites, as defined in the Act) where no minerals development was carried out to any substantial extent in, on, or under the site at any time in the period beginning on 22 February 1982 and ending with 6 June 1995. These sites still have valid planning permissions but, since 1st November 1995 it has not been lawful to recommence or carry on working a dormant site until full modern planning conditions have been approved by the Local Planning Authority (LPA), through the process of an initial ROMP review (see below). In some areas there are additional, 'dormant IDO' sites, as defined within the Planning and Compensation Act, 1991. These are sites which were originally granted consent under 'Interim Development Orders' (IDOs), in the period between 22 July 1943 and 1 July 1948, and which were subsequently registered under the 1991 Act (thus retaining valid planning permission), but where no substantial work was carried out between 1 May 1989 and 30th April 1991. For these sites, a scheme of operation and restoration conditions is required to be submitted to the relevant LPA together with an acceptable Environmental Assessment, before they can lawfully be reactivated.
ROMP	The acronym for 'Review of Old Mineral Permissions' carried out in accordance with the Environment Act 1995. Sites which obtained planning permission between 1948 and 1982, whether active, inactive or dormant, were required by this Act to be subject to an Initial Review in order that modern planning conditions can be agreed. In addition, all sites (including reactivated ISO permissions) are required to be subject to subsequent Periodic Reviews at intervals of not less than 15 years. ROMP applications cannot be refused, since valid planning permissions already exist. However, court judgments, guidance and regulations have since clarified that both the ROMP process, and the approval of new conditions at IDO sites, amount to obtaining new development consents and are therefore subject to Environmental Impact Assessment.
Stalled ROMP / Suspended Permission	Where a ROMP review has begun but has not been completed (e.g. because an Environmental Statement has not been submitted), the ROMP process is said to have 'stalled'. In accordance with the Town and Country Planning (Environmental Impact Assessment) (Undetermined Reviews of Old Mineral Permissions) (Wales) Regulations 2009, planning permission then becomes 'suspended' - i.e. it ceases to authorise any minerals development. As with dormant sites, suspended permissions cannot lawfully be operated until the process (including Environmental Impact Assessment) has been completed and modern conditions agreed.

Abbreviations

The following abbreviations are commonly used throughout the RTS.

AAV	Aggregate Abrasion Value
AM survey	Aggregate Minerals survey
AONB	Area of Outstanding Natural Beauty
BAA	British Aggregates Association
BGS	British Geological Survey
BMAPA	British Marine Aggregate Producers Association
CD&EW	Construction, Demolition and Excavation Waste
CPRW	Council for the Protection of Rural Wales
EA	Environmental Assessment
EC	European Commission
EIA	Environmental Impact Assessment
EMAADS	*Establishing a Methodology for Assessing Aggregates Demand and Supply* (project title)
ES	Environmental Statement
EU	European Union
FBA	Furnace Bottom Ash
GDP	Gross Domestic Product
GIS	Geographic Information System
HMRC	Her Majesty's Revenue & Customs
HSA	High Specification Aggregate
IDO	Interim Development Order
IMADP	Interim Marine Aggregates Dredging Policy
IMAECA	*Implementing the Methodology for Assessing the Environmental Capacity for primary Aggregates* (project title)
ISO	International Organisation for Standardisation
LDP	Local Development Plan
LPA	Local Planning Authority
MASS	Managed Aggregate Supply System
MHCLG	Ministry of Housing, Communities and Local Government
MPA	Mineral Products Association
MPPW	Minerals Planning Policy Wales
mt	Million tonnes
mtpa	Million tonnes per annum
MTAN	Minerals Technical Advice Note
NPA	National Park Authority
NRW	Natural Resources Wales
OBR	Office of Budget Responsibility
PFA	Pulverised Fuel Ash
POS	Planning Officers Society
PPW	Planning Policy Wales
PSV	Polished Stone Value
RAWP	Regional Aggregate Working Party
ROMP	Review of Old Mineral Permissions
RTS	Regional Technical Statement
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SSSI	Site of Special Scientific Interest
WG	Welsh Government