

**Derbyshire and Derby
Minerals Local Plan 2022 – 2038
Pre-submission Draft Plan**

**Strategic Flood Risk
Assessment – Supplementary
Sequential Test**

February 2023



Derby City Council



DERBYSHIRE
County Council

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1. Introduction

- 1.1 Derbyshire County Council and Derby City Council are currently working together to prepare a new joint minerals local plan which will cover the period to 2038. It will be called the Derbyshire and Derby Minerals Local Plan (DDMLP) and the plan area will cover the geographical county of Derbyshire, excluding that part which falls within the Peak District National Park. The plan sets out strategic priorities for minerals development through its vision and objectives. It includes strategic policies to address those priorities, including policies to enable the supply of important minerals and, where necessary, it identifies specific sites for mineral working. A Regulation 19 Pre-Submission version of the DDMLP, will be published for consultation on 7 March 2023.
- 1.2 The National Planning Policy Framework (NPPF) and supporting National Planning Practice Guidance (PPG) require local planning authorities to carry out a Strategic Flood Risk Assessment (SFRA) of their local plans and also to carry out a Sequential Test of proposed site allocations in their local plans to ensure that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Where it is not possible to locate development in low-risk areas, the PPG requires that the Sequential Test should go on to compare reasonably available sites:
- Within medium risk areas; and
 - Then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas.
- 1.3 The following sections of this paper set out further details of the requirements of the NPPF and PPG for local planning authorities in undertaking a SFRA and sequential, risk-based approach to support their local plan preparation and how these requirements have been taken into account in preparing the DDMLP.
- 1.4 Derbyshire County Council and Derby City Council have jointly commissioned Aecom consultants to undertake a SFRA of the DDMLP. This paper sets out how the SFRA has been considered and influenced the production of policies in the Local Plan and proposed site allocations for minerals development. The SFRA sets out specific recommendations

for how the Sequential Test should be applied to the consideration of proposed site allocations in the Local Plan.

- 1.5 Key to the development of policy and identification of preferred mineral site allocations in the DDMLP has been the input of statutory consultees, particularly the Environment Agency (EA). The EA has been consulted at each stage of preparation of the Local Plan, particularly the Regulation 18 Draft Local Plan, when it provided extensive and detailed comments on the policies and site allocations included in the Plan that had particular implications for flooding and flood risk; and recommendations of how the Sequential Test should be applied to the identification of suitable sites for allocation for minerals development in the Local Plan. These comments have been particularly important in helping the Mineral Local Planning Authorities (MLPA) to shape the policies and identification of proposed mineral site allocations in the Plan. Details of these comments are provided in Section 4 below.
- 1.6 Applying the requirements of the NPPF and PPG for undertaking the Sequential Test and taking into account other guidance and advice on the application of the Test recommended in the SRFA and by the EA, a detailed Sequential Test has been carried out in the Appendix to this paper for each of the allocations that have been considered in the progressing the Local Plan, that includes both proposed site allocations that have been included in the Regulation 19 Pre-Submission Plan and other sites that have not been carried forward as allocations in the Plan. In this regard, the Assessment indicates that with the exception of the Elvaston Quarry site allocation, which is partly located within Flood Zone 3b and a designated flood warning area, all the other proposed site allocations are not located within areas that would be likely to result in high risk of flooding. In this regard, the SFRA and advice received from the EA has not identified any fundamental concerns or objections with any of the site allocations and their potential risk to flooding. With regard to the Elvaston site, the EA has recommended a range of measures that should be included in the detailed policy requirements for the site, particularly the need for a site specific Flood Risk Assessment (FRA), to minimum the risk of flooding associated with the site.
- 1.7 Overall, on the basis of the above, Section 5 below concludes that Derbyshire County Council and Derby City Council consider that the requirements of the Sequential Test set out in the NPPF and PPG have

been fully met in the process of allocating sites in the DDMLP for minerals development.

2. National Planning Policy and Guidance

National Planning Policy Framework

- 2.1 Section 14: Meeting the Challenge of Climate Change, Flooding and Coastal Change of the NPPF sets out strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, new development should not be allowed.
- 2.2 Paragraph 159 of the NPPF advises local planning authorities that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.
- 2.3 Paragraph 160 requires that strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency (EA) and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.
- 2.4 With regard to the Sequential Test, paragraph 161 requires that all plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:
 - a) applying the sequential test and then, if necessary, the exception test as set out below;
 - b) safeguarding land from development that is required, or likely to be required, for current or future flood management;
 - c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

- d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.
- 2.5 Paragraph 162 clarifies that the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.
- 2.6 Finally, paragraph 163 advises that, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3. In this regard, Annex 3 classifies sand and gravel workings as 'Water Compatible' and all other minerals working and processing is classed as 'Less Vulnerable'. Secondly, the vulnerability classifications have differing compatibility with Flood Zones, as set out in Table 2 (see below). 'Water compatible' development (sand and gravel workings) are acceptable in all flood zones, but all other minerals development ('less vulnerable') is only suitable in flood zones 1-3a.
- 2.7 To pass the exception test, paragraph 164 clarifies that it should be demonstrated that:
- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
 - b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

National Planning Practice Guidance

- 2.8 The sequential, risk-based approach is discussed in more detail in the PPG. The PPG sets out details on how the sequential test can be applied in the preparation of strategic policies. This is illustrated in diagram 2 (see below). The PPG makes clear that the Sequential Test needs to be

applied to the whole local planning authority area to increase the possibilities of accommodating development, which is not exposed to flood risk, both now and in the future.

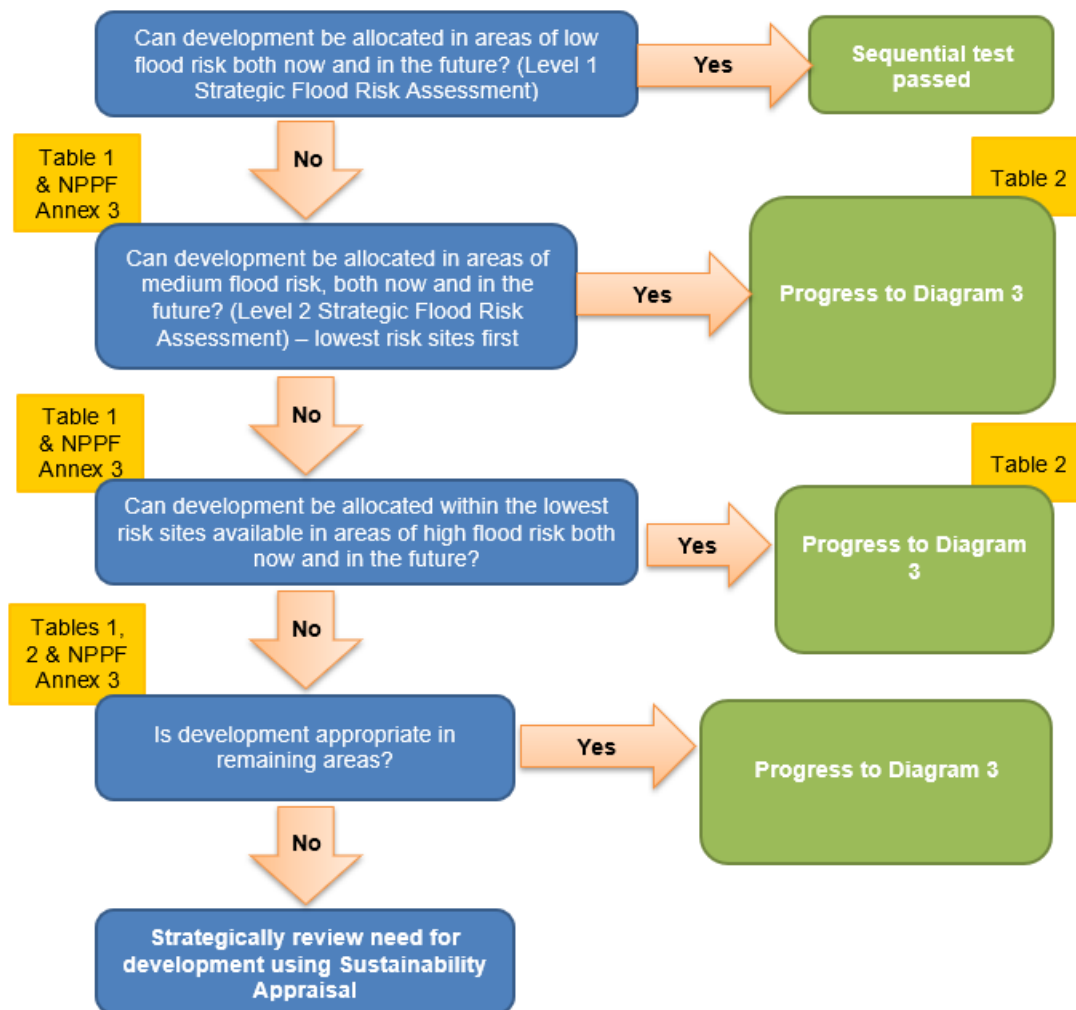
- 2.9 The PGG also sets out specific guidance on how the Sequential Approach should apply to minerals and waste development as follows:

Waste and mineral planning authorities should apply the sequential approach to the allocation of sites for waste management and, where possible, mineral extraction and processing. It should also be recognised that mineral deposits have to be worked where there is no scope for relocation and sand and gravel extraction is defined as ‘water-compatible development’ in the NPPF, acknowledging that these deposits are often in flood risk areas.

However, mineral working should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly.

Mineral workings can be large and may afford opportunities for applying the sequential approach at the site level. It may be possible to locate ancillary facilities such as processing plant and offices in areas at lowest flood risk. Sequential working and restoration can be designed to reduce flood risk by providing flood storage and attenuation. This is likely to be most effective at a strategic (county) scale.

Diagram 2: Application of the Sequential test for Plan Preparation



2.10 The PPG (see Table 1 below) sets out definitions of each of the flood zones from flood zone 1 to flood zone 3b. It also set outs details of flood risk vulnerability and flood zone incompatibility, based on Annex 3 of the NPPF (see table 2) below. It can be seen that water compatible development and uses that includes sand and gravel extraction is deemed to be compatible with flood zones 1, 2, 3 3a and 3b. However, the footnotes that accompany Table 2 clarify that, in respect of Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

2.11 'Less vulnerable' development or uses, which includes all other mineral development and uses, are deemed to be compatible with flood zones 1, 2 and 3a but not flood zone 3b, where development should not be permitted.

Table 1: Flood Zones

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	<p>This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:</p> <ul style="list-style-type: none"> • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). <p>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)</p>

Table 2: Flood risk vulnerability and flood zone ‘incompatibility’

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Key:

✓ Exception test is not required

X Development should not be permitted

Applying the sequential, risk-based approach to potential mineral site allocations in Derby and Derbyshire

2.12 Although the PPG advises that the application of the sequential approach should only be applied where possible to minerals extraction and processing, the Derby and Derbyshire MPAs consider that the test can be applied to the proposed non-sand and gravel allocation sites in the DDMLP, whilst recognising such mineral deposits have to be worked

where there is no scope for relocation. However, as noted in the NPPF and PPG, sand and gravel extraction is defined as 'water-compatible development' acknowledging that these deposits are often in flood risk areas, so the sequential assessment that is contained in this document, does not assess the proposed sand and gravel extraction sites through the sequential approach. Furthermore, the exception test is not required for any minerals development and so is not discussed further in this paper or assessment.

- 2.13 With regard to non-sand and gravel sites, however, the Sequential Assessment in this paper, appraises sites that have been confirmed in the Regulation 19 Pre-Submission Plan as proposed site allocations and also those sites that have previously been promoted to the authorities as potential sites for allocation but that have subsequently received planning permission and therefore not taken forward as allocations. Details of why these sites have not been included with the Regulation 19 Plan are provided where appropriate in the assessment.

3. Review of the SFRA, showing how it has been considered and influenced the production and policies of the Minerals Local Plan and application of the Sequential Test.

- 3.1 Derbyshire County Council and Derby City Council have jointly commissioned Aecom consultants to undertake a SFRA of the DDMLP. The sections below provide a review of the SFRA, showing how it has been considered in, and has influenced, the production of policies of the Minerals Local Plan and the application of the Sequential Test to preferred site allocations in the Plan.
- 3.2 A Level 1 SFRA prepared by Derbyshire County Council and Derby City Council was published in August 2012 to inform the Minerals and Waste Local Development Framework. The SFRA informed the planning decision process by considering the nature and scale of flood risk and considered measures to minimise the risk to developments and life posed by flooding through sustainable development. Since 2012, flood risk legislation and flood risk datasets have been updated and as such, AECOM Ltd have been commissioned by the authorities to prepare an update to the Level 1 Minerals SFRA.
- 3.3 The Level 1 Minerals SFRA has been prepared in accordance with the requirements of NPPF and associated PPG and is based on the best available flood risk information at the time of preparation. Data has been provided by online Environment Agency resources, publicly available external sources and hydraulic modelled outputs retrieved from the Environment Agency for 16 No. of 1D-2D fluvial models across the study area.
- 3.4 The key aim of the Level 1 Minerals SFRA is to guide development to the appropriate Flood Zone using the Sequential Test. The SFRA provides information required to apply the Sequential Test for identification of land suitable for allocation for development. It recommends that planning authorities should seek to allocate sites for future development within areas of lowest flood risk including Flood Zone 1, and then sequentially to Flood Zone 2 and 3 if appropriate.

- 3.5 The SFRA study area covers a total of eight Borough / District councils: Amber Valley, Bolsover, Derbyshire Dales, North East Derbyshire, South Derbyshire, Chesterfield, Erewash and High Peak. The western area near the Peak District National Park is mainly rural whilst towards the east is more urban nature including main towns such as Derby City.
- 3.6 The SFRA notes that the majority of mineral resources lies within the administrative boundary of Derbyshire County Council where the most significant mineral worked is limestone, accounting for 91% of annual mineral production within the area. There are limited unworked resources of sand and gravel in Derby City but these have not been worked for many years.
- 3.7 It is also noted that County of Derbyshire covers a geographically large and diverse area of England which contains many large main rivers and other smaller watercourses. As such, flooding across the county is apparent, especially within the low-lying areas of the county. The SRFA highlights that future development may exacerbate problems of this nature if not carefully designed, blocking flow paths and increasing the magnitude and speed of runoff from the site.
- 3.8 Overall, the SRFA provides an overview of flood risk issues across all eight districts within the study area. The core output of the study is a production of county wide maps, which includes a narrative of flood risk issues in relation to the proposed mineral sites. In accordance with the NPPF, mineral workings and processing are characterised as 'Less Vulnerable' and sand and gravel workings are categorised as 'Water Compatible' development. The SFRA highlights that the Sequential Test must be followed before sites at risk of flooding are identified as suitable for extraction. It recognises that flooding will increase as a result of climate change. As such, the update to the SFRA identifies flood risk now and in the future so that actions can be taken to mitigate this risk.
- 3.9 Section 8 of the SRFA sets out the policy context to the application of the Sequential Test set out in the NPPF and associated PPG.
- 3.10 In particular, Section 8 of the SRFA, sets out specific recommendations relating to the Sequential test. It notes that the assessment provides a high-level assessment of flood risk posed to the site area. However, it emphasises that is essential that site-specific flood risk assessments are produced for individual mineral developments and suitable mitigation measures are recommended, where appropriate. Section 8 sets out

recommendations and guidance for site specific flood risk assessments that are required for submission alongside planning applications for mineral sites in Derbyshire to the LPA. It highlights that the assessment must determine the vulnerability classification of the development, then decide how the flood risk will be managed both now and in the future with consideration given to climate change requirements.

Sequential Approach within Development Sites

3.11 The SRFA recommends that all site-specific flood risk assessments should use the Sequential Test. If development pressure results in the need to develop on more vulnerable land in higher flood risk areas, appropriate mitigation measures should be implemented which create a flood resilient development and do not increase the risk of flooding to surrounding areas.

Surface Water Management

3.12 With regard to surface water management, the SRFA recommends that a site-specific FRA will need to include how surface water run off generated by the development will be managed. It highlights that, as surface water flooding is the most widespread form of flooding in England, managing this risk is vital. It is noted that the NPPF and PPG require LPAs and developers to reduce the cause and impacts of flooding through the design and layout of developments; and that the NPPF states that flood risk should not be increased elsewhere as a result of new development and as such surface water runoff flowing offsite should not increase from existing rates. In addition, the PPG states that this should be applicable over the lifetime of a development and should take into account climate change allowances.

3.13 The SRFA makes reference to the publication of the Government's surface water management action plan in July 2018, with 22 actions to help mitigate the risk from surface water flooding. The actions include:

- improving risk assessment and communication;
- making sure infrastructure is resilient;
- clarifying responsibilities for surface water management;
- joining up planning for surface water management; and
- building local authority capacity.

3.14 With regard to sustainable drainage systems (SuDs), the SRFA notes that these are a preferred method of surface water management technique and that SuDS are designed to control surface water run off close to where water falls within the catchment and to mimic natural drainage. SuDS also provide wider benefits including opportunities to:

- Reduce the causes and impacts of flooding;
- Remove pollutants from urban run-off at source; and,
- Combine water management with green space with benefits for amenity,

3.15 However, the SRFA concludes that SuDS may not always be the most suitable technique for some forms of development, including mineral extraction.

Residual Risk

3.16 With regard to residual risks, the SRFA indicates that these are risks that remain once the sequential test has been undertaken and mitigation techniques have been implemented, however a potential flood risk still remains. The PPG states the two main forms of residual risk are

- Residual risk from flood risk management infrastructure; and
- Residual risk to a development once any site-specific flood mitigation measures are taken into account. Examples of residual risk include:
 - a breach of a raised flood defence, blockage of a surface water conveyance system or failure of a pumped drainage system;
 - failure of a reservoir; and
 - a flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot accommodate.

3.17 In this regard, the NPPF states that residual risk(s) of flooding should be included with a site-specific FRA, and should indicate the nature, variation and severity of residual risk within the area. Furthermore, an FRA should provide guidance on how to manage residual risk.

3.18 To achieve the aims of the NPPF with regard to site-specific FRAs, the SRFA recommends that Derbyshire County Council and Derby City should:

- Ensure that the Sequential Test is implemented for all developments within both administrative areas;
- Look at the vulnerability classifications associated with developments and any local emergency planning issues when deciding on a suitable location for mineral sites;
- Understand the cumulative impact of development on flood risk from all sources of flooding. It should be noted that minerals sites typically cover a large area and therefore the cumulative impact may be considerable;
- Ensure the management of residual risks after the sequential approach has been utilised;
- Consider flood risk as one of a number of policies that in parallel can provide mechanisms to deliver sustainable developments with multiple benefits;
- Encourage a reduction in the causes and impacts of flooding through the layout and form of development including the use of SuDS; and,
- Engage with developers and local regulators throughout the development process to develop and instigate initiatives for the reduction of flood risk.

4. Environment Agency Response to the Regulation 18 Draft Local Plan

4.1 The EA has been consulted at each stage of the preparation of the DDMLP. In particular, it was consulted on the Draft Regulation 18 Version of the DDMLP in March 2022 and responded to the consultation on 29th April 2022. The consultation response provides extensive comments on all the Plan's policies and site allocations that are likely to have implications for flooding and flood risk.

4.2 In this regard, comments were particularly made by the EA on Chapter 8: Policy DM8: Water Management and Flood Risk, as set out below:

We welcome that a policy has been included looking at flood risk and water management.

Flood Risk

*From a flood risk perspective, we welcome that development cannot have an unacceptable impact on a number of factors such as conveyance routes, integrity of flood defences etc. We would recommend an additional bullet point requiring appropriate easements from excavation works safeguarding the physical integrity of watercourses such as **'the physical integrity of watercourses through suitable easements between a river bank and the proposed excavation area'**.*

We normally recommend a minimum stand-off of 30m up to 45m for larger watercourses, but recommend a site specific geomorphology assessment that looks into the probability of rivers breaching into quarry pits, where a site borders a watercourse. From this, a suitable easement between the watercourse bank and the edge of the quarry can be established.

*Therefore, we would recommend the inclusion of the following paragraph within the policy – **'As part of any application, a site specific geomorphology assessment must be undertaken to determine the minimum stand-off required from any watercourse.'***

*We would suggest the following is included within the policy wording **'All proposals will be expected to incorporate flood risk protection, flood resilience measures appropriate to the character and biodiversity of the area and the specific requirements of the site, and ensure development***

does not increase flood risk to the site, or to others’. We would highlight that strategic objective 8 highlights that mineral development will be designed and operated in such a way that will reduce the risk of flooding on site and off site. Therefore can the wording for this policy be strengthened beyond existing national policy to require flood risk reductions at these stages as part of the planning applications.

Restoration also offers the opportunity to provide multifunctional environmental enhancements, which would also include opportunities to reduce the impacts of flood risk to the site and to others. Additional wording could be included with this policy requiring developers to use the opportunity of restoration to provide flood risk reductions compared to the existing situation. An example of this can be found in Nottinghamshire’s Mineral Plan. **‘Where the opportunity exists, restoration proposals should seek to incorporate flood risk reduction measures e.g. flood plain storage and reconnection, flood defence structures, and land management practices to benefit local communities’.**

In section 11.96 the Local Plan mentions that Mineral Extractions can ‘temporarily reduce storage capacity and therefore increase the risk of flooding elsewhere’. The Environment Agency would query this assertion and argue that all development, no matter how temporary in nature should not increase flood risk to elsewhere and therefore other people not directly involved in the proposed development. This paragraph does not appear to correlate with the requirements of strategic objective 8 for mineral development to be designed to reduce flood risk to the site and to others and therefore ask that this section is either removed or reworded to ensure that this strategic aim is implemented.

Section 11.96 appears to conflate river flooding with surface water flooding and runoff. Minerals sites within the floodplain of a river can occupy floodplain storage and divert river flood flows with bunds etc, potentially increasing flood risk elsewhere. Surface water flooding from rainfall onto hardstandings would normally be a much smaller volume and a different form of flooding more local to the site, with more local impacts. The paragraph suggests SUDS to resolve flooding issues however SUDS cannot be used to mitigate river flooding, only surface water flooding. We suggest having a separate paragraph on river flooding and another on surface water.

Flood risk will need to be addressed satisfactorily to demonstrate that any extraction or restoration works do not increase flood risk elsewhere (taking account of climate change), that there is no net loss of floodplain storage, that any ancillary development is located in areas of lowest risk, and site personnel can be kept safe from flooding.

- 4.3 The EA also commented on other policies in the Plan that had potential implications for flooding and flood risk, particularly mineral related development as follows:

Mineral related development

Policy 11.195 – It is important that plant machinery and buildings are located in the area of lowest flood risk on site, or at a nearby off-site location at lower flood risk, ideally out of the floodplain. This is especially valid at sand and gravel quarries which are often at least partially located in the functional floodplain. Plant machinery and buildings occupy floodplain storage which may increase flood risk elsewhere. They may also be washed away or displaced by flood water and impact structures such as flood defences and bridges. The site personnel using the buildings would also be at flood risk, whereas situating staff facilities outside of the floodplain would provide a safe refuge point.

- 4.4 Of particular relevance to the Sequential Test assessment in this document, the EA provided general comments on the individual site allocations in the Plan together with specific comments on the individual proposed allocations. The general comments that applied to all the allocations was as follows:

General Flood Risk Comments for Allocated Sites

Although sand and gravel extractions are considered ‘water compatible’ developments in accordance with Table 2 of the Planning Practice Guidance (appropriate land use for all flood zones), other mineral extractions are classed as ‘less vulnerable’ and should not be located in Flood Zone 3b, the functional floodplain. Despite these classifications, the sequential approach must still be applied, that is to say lower risk sites should be developed ahead of higher risk sites.

The Planning Practice Guidance: Flood Risk and Coastal Change provides the following guidance “Mineral workings can be large and may afford opportunities for applying the sequential approach at the site level. It may be possible to locate ancillary facilities such as processing plant

and offices in areas at lowest flood risk. Sequential working and restoration can be designed to reduce flood risk by providing flood storage and attenuation”.

A number of the preferred sites are located in or close to a floodplain. A site-scale Flood Risk Assessment (FRA) will be required for each of these sites. Mineral working must not increase flood risk elsewhere and need to be designed, worked and restored accordingly. The FRA must demonstrate that the development will not:

- 1. Reduce the storage capacity of the floodplain*
- 2. Obstruct flow paths*
- 3. Increase flood risk to adjacent land*
- 4. Adversely affect the stability of the river bank and channel*
- 5. Adversely affect the operation of existing flood defence schemes and assets*
- 6. Have an unacceptable adverse impact on groundwater conditions, surface water drainage and the capacity of the soils for future use*
- 7. Any stockpiles and non-essential ancillary buildings must be located outside of Flood Zone 3b (functional floodplain)*

A Sequential approach to the layout of the development should be adopted as a means of achieving this. Mineral workings often excavate below the natural water table, which during periods of heavy rainfall may rise. Mineral workings often operate a pumped system and can therefore interfere with groundwater flow and should be appropriately addressed in a FRA. The FRA should contain details of the areas to be worked, including any planned phasing of extraction and the details of all ancillary features. A restoration plan must be included, with a preference to creating flood storage and wetland areas.

- 4.5 The EA also provided more detailed comments on each of the preferred proposed allocations set out in the Draft DDMLP, which included allocations at:

- Foston
- Sudbury
- Swarkstone North
- Swarkstone South
- Elvaston
- Aldwark South

4.6 Of particular relevance to the Sequential Test, the proposed allocation site at Elvaston, is the only preferred site allocation that is partly located within Flood Zone 3b. In this respect, the EA made the following comments on this allocation as follows:

Elvaston

We welcome that section 4) highlights that the site is situated in fluvial flood zones. A detailed flood risk assessment (FRA) will need to be produced to ensure the development does not increase flood risk to the site or to others during the operational phase of the development in line with the requirements set out under our ‘general flood risk comments for allocated sites’.

*We ask that the following wording is also included within the planning requirements: ‘**A detailed flood risk assessment (FRA) to be provided showing how, through all development phases (Construction, Operation and Restoration), that there will be no increase in flood risk to the site and to others. Opportunities to provide betterment in flood risk, and other environmental enhancements at the restoration stage, should be explored.**’*

There should be no excavations within 45 metres of the River Derwent, or flood defences, particularly around meanders which are a zone of active erosion. Piles of overburden/soil should be moved and stored, where possible, out of the floodplain. Any remaining bunds should be positioned in parallel with the flow direction, to maintain flow routes through the floodplain. Bunds should also be broken into sections rather than a continuous line. If the bunds are being left for any substantial length of time they should be grassed over to protect them from being washed downstream during a flood. There should be no raised haul roads or bunds either side of the roads. Any conveyors should be raised above the 1% AEP (Annual Exceedance Probability) flood to prevent

obstructions on the floodplain which could collect debris during a flood event. A culvert is proposed over the Ambaston Brook, this is an Ordinary Watercourse and permission should be sought from the Lead Local Flood Authority. The Environment Agency does not usually support new culverting and we would ask that opportunities to ensure deculverting is not required in investigated. The FRA should also detail how the restoration proposals will provide flood risk betterment to the site and to others.

*A detailed plan to ensure there is no negative impact on the adjacent watercourses including, but not limited to, the reduction of water levels, the integrity of the watercourse, and ensuring there is no water quality impact by ensuring there is no increase in sediment input from pumping operations or other potential activities that could cause silt input. We would ask that the following wording is included as a principal requirement, **‘A detailed management plan highlighting the necessary pollution mitigation measures during the construction and operation of the quarry to ensure the protection of watercourses, surface water quality and groundwater quality’.***

We ask that the planning requirements also include some reference to ensure that restoration of the site provide multifunctional environmental enhancements, including, but not limited to, reducing the impacts of flood risk to others, providing significant biodiversity net gain, providing water quality improvements etc.

Where applicable an assessment on the potential of the proposal to impact a designated/ non designated site needs to be completed and the relevant party consulted accordingly to ensure that any impact is mitigated appropriately.

As the proposal is developed we would expect to see an Ecological Impact Assessment (EIA) undertaken. The assessment should outline impacts along with mitigation, compensation and enhancement measures in addition to residual and cumulative impacts. The EIA should include an Extended Phase 1 Habitat survey undertaken for each of the potential mineral sites. This will outline the broad habitat types present on the site and highlight the potential for protected species to be present and inform which specific surveys will need to be undertaken prior to any works commencing to aid mitigation and enhancement opportunities.

*We would also recommend that similar wording to the following is also included to ensure where an abstraction licence is required, this is sorted out before the planning application stage, **'Prior to making a planning application, applicants should discuss water abstraction issues with the Environment Agency'**.*

*We recommend that the operator for the site parallel tracks any permit applications (eg flood risk, waste etc) with the planning application and would recommend the following wording **'Applicants should contact the Environment Agency to discuss any permitting requirements, and where required, should look to parallel track these permit applications alongside the planning application'**.*

5. Overall Conclusions

- 5.1 The sections above in this document have considered the requirements of the NPPF and PPG for local planning authorities to undertake a Sequential Test of their proposed mineral site allocations in their Local Plans, to ensure that that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Further advice on the application of the Sequential Test to the site allocations in the DDMLP has been provided in the SFRA that has been commissioned by Derbyshire County Council and Derby City Council. Advice on the application of the Sequential Test to the site allocations has also been provided by the EA through its consultation responses on various stages of preparation of the DDMLP, particularly its response on the Regulation 18 Draft Local Plan.
- 5.2 The advice and guidance above has been used by Derbyshire County Council and Derby City Council to apply the Sequential Test to the proposed mineral site allocations in the DDMLP. A Sequential Assessment of each site allocation has been undertaken and details provided in the appendix to this document.
- 5.3 The Assessment indicates that with the exception of the Elvaston Quarry site allocation, which is partly located within Flood Zone 3b and a designated flood warning area, all the other proposed site allocations are not located within areas that would be likely to result in high risk of flooding. In this regard, the SFRA and advice received from the EA has not identified any fundamental concerns or objections with any of the site allocations and their potential risk to flooding.
- 5.4 With regard to the Elvaston site, the EA has not raised any fundamental objections to the inclusion of the site in the Local Plan as an allocation but has suggested a number of measures to ensure that the site does not result in any potential flooding issues, particularly that a detailed FRA will need to be produced to ensure the development does not increase flood risk to the site or to others during the operational phase of the development in line with the requirements set out under its general flood risk comments for allocated sites. The EA has also recommended a number of wording amendments to the site specific policy requirements for the allocation as set out in Section 4 above.

5.5 Overall, therefore, Derbyshire County Council and Derby City Council consider that the requirements of the Sequential Test set out in the NPPF and PPG have been fully met in the process of allocating sites in the plan for minerals development.

Appendix 1: Sequential test of Promoted Sites

Sites	Mineral	Site area (ha)	Tonnage shown as million tonnes (mt)	Flood zone 1 % of total area	Flood zone 2 % of total area	Flood Zone 3a % of total area	Flood zone 3b % of total area	Flood warning area	Area susceptible to Surface water flooding? Low risk: 1 in 1000 (LR) Medium Risk: 1 in 100 years (MR) High Risk: 1 in 30 years (HR)	Area susceptible to ground water flooding (<25%) (25-50%) (50-75%) (>75%)	Main river	Are there any 'reasonably available' sites at lower flood risk that would be suitable for the development	Are there opportunities to locate processing plant, stockpiles and ancillary buildings outside of FZ2, FZ3 and areas at high risk of surface water flooding, applying the sequential approach within the site?	Sequential test passed	Exception test required	Site taken through to allocation and, where a site has not been allocated, the reasons why
Aldwark South	Industrial limestone	25	24mt	X 100%				No	Yes LR Localised to adjacent highway and field boundary at northern end of site.	Yes (<25%)	No	N/A – all land in flood zone 1	N/A – all land in flood zone 1	Yes	No	Yes
Mouselow Quarry	Brick clay	1.5	0.85mt	X 100%				No	Yes LR/MR/HR Localised small areas of LR/MR/HR in existing quarry void, along site access	Yes 25-50%	No	N/A – all land in flood zone 1	N/A – all land in flood zone 1	Yes	No	No – Planning permission granted prior to adoption
Whitwell	Industrial limestone	10	2.3mt	X 100%				No	Yes LR/MR/HR Localised areas of LR/MR/HR in existing quarry void	yes 50-75%	No	N/A – all land in flood zone 1	N/A – all land in flood zone 1	Yes	No	No – planning permission granted prior to adoption
Willington (Site ref: SG01)	Sand and gravel	64	2.85 mt		X	X	X	No	Yes	Yes	Yes	No.	No.	Sand and gravel	No	No – planning permission

					100%	100%	100%		LR/MR/HR Localised along Highbridge lane, ditches and field boundaries Areas of MR/HR focused on existing small waterbodies and depressions in ground surface.	25-50%	River Dove / River Trent	Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	Site is extension to an existing quarry site with processing plant in, stockpile areas and ancillary buildings in FZ3 which have been designed to minimise flood risk elsewhere + incorporate SuDS where possible.	extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations. However, there is potential to incorporate improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	granted prior to adoption
Twyford	Sand and gravel	159	6.25		X 70%	X 30%	No	Yes LR/MR/HR Northern area: Areas of LR concentrated along ditches and field boundaries and isolated depressions in ground surface particularly in area close to access to Merry Bower farm. Southern area: Areas of LR limited to existing depressions	Yes >75%	Yes River Trent	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	No. site promoted by 2 operators. One operator works adjacent Swarkestone Q site with processing plant, stockpile areas and ancillary buildings in FZ3a which have been designed to minimise flood risk elsewhere + incorporate SuDS where possible.	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate improvements to flood capacity as	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	No Scored less well in the SA particularly in respect of landscape and historic setting. NB: A small parcel of land in NW corner granted consent to work 250,000 tonnes in 2017.	

									within ground surface. MR/HR concentrated on a small pond north of River Trent				2 nd operator would need to establish new plant site north of A5132 but this is in FZ3a and would need to be designed and located appropriately.	apart of site restoration (covered in DM policies DM8,12 and 15)		
Swarkestone North (smaller site)	Sand and gravel	100	4.5mt			X c.40%	X c.60%	No	Yes LR/MR/HR Areas of LR limited to existing depressions within ground surface. MR/HR concentrated on a small pond north of River Trent.	Yes >75%	Yes River Trent	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	No. Site is extension to an existing quarry site with processing plant, stockpile areas and ancillary buildings in FZ3a which have been designed to minimise flood risk elsewhere + incorporate SuDS where possible. Mineral processing considered appropriate in FZ2 and 3a.	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	Yes Recommendations relating to: Scope to deliver multi functional restoration scheme Potential cumulative impacts associated with concurrent working However these issues are covered in Policies DM 4,8,12, 14 and 15 of the Plan.
Swarkestone South	Sand and gravel	140	5mt			x	X 100%	No	Yes LR/MR/HR Predominantly areas of LR which are present throughout the site along field	Yes >75%	Yes River Trent	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in	No Site is extension to an existing quarry site with processing plant, stockpile areas and	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be	Yes 2.5mt consented in 2018 and represents current extraction area. Recommendations relating to:

									boundaries and ditches. MR/HR concentrated along field boundaries in centre of the site as well as an existing pond and depressions in ground surface in east of site.			fluvial floodplains and are classified as 'water compatible' development	ancillary buildings in FZ3a which have been designed to minimise flood risk elsewhere + incorporate SuDS where possible Mineral processing considered appropriate in FZ2 and 3a.	seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	Scope to deliver multi functional restoration scheme Potential cumulative impacts associated with concurrent working However, these issues are covered in Policies DM 4,8,12, 14 and 15 of the Plan.
Elvaston	Sand and gravel	50	1.5mt		X 100%	X c.34%	X C.66%	Yes Emergency plan will be required as part of detailed planning application. Recommend Principal Planning Requirements for site be modified to include this.	Yes MR/LR LR appear mainly limited to ditches and drains in the site. Some further areas of predominantly LR with some MR in the northern part of site close to the River Derwent, possibly associated with depressions in topography.	Yes >75%	Yes River Derwent	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	No Operator would refurbish existing processing plant which is located in FZ3a and would be considered acceptable in this location. Scope to minimise flood risk through detailed design at application stage Conveyor would be located in FZ3b but this already has consent under the terms of planning permission CM9/	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	Yes with Recommendations relating to the need for: Emergency Plan Detailed design etc for replacement plant Cumulative impacts arising from continued working Beneficial impacts which could be achieved via the restoration scheme. However these issues are covered in Policies DM8,12, 14 and 15 of the Plan

Repton/Foremark	Sand and gravel	177	11.2mt		X 100%	X c.25%	X c.75%	No	Yes LR/MR/HR Areas of LR concentrated along ditches and field Boundaries Concentrated area of LR/MR/HR surface water flooding in eastern part of site where it is located west of Meadow Lane. This extends to the area immediately to north of site.	Yes 50-75%	Yes Old Trent Water	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	Yes/No Processing plant would be located north of Twyford Road in FZ2 and FZ3a and would be considered appropriate in this location. Scope to minimise flood risk through detailed design at application stage. But transport from extraction area would be via a new temporary bridge over the River Trent in FZ3b.	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	No Scored less well than other sites in the site assessment methodology, particularly in respect of historic setting and archaeology.
Foston	Sand and gravel	3.1mt	8mt		X 100%	X 100%		No	Yes LR/MR/HR Areas of extensive LR concentrated mainly along eastern and southern edges of site (the latter possibly highlighting an earlier river course?), although some areas found adjacent to Leathersley Lane in north.	Yes >75%	Yes Foston Brook	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	No – all parts of the site Operator has indicated that processing plant would be located in north of site, close to Leathersley Lane which is in FZ3a	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	Yes Recommendations relating to: Detailed design and location of processing plant so as to minimise flood risk within the site or elsewhere Scope to deliver multi-functional restoration scheme Potential cumulative impacts associated with concurrent working

									MR minimal concentrated along eastern site boundary and along field boundaries and along site boundary with Leathersley Lane. Minimal area of HR on norther boundary concentrated					improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)		No impacts to existing flood defence infrastructure as a result of the development However these issues are covered in Policies DM8,12, 14 and 15 of the Plan.
Sudbury	Sand and gravel	79.3	2mt		X 100%	X 100%		No	Yes LR/MR/HR Extensive areas of LR in west of site, close to A515, running centrally through site on NW-SE axis and along Leathersley Lane. MR concentrated along field boundaries, in existing ponds and along Leathersley Lane. Small areas of high risk concentrated along field boundaries and on northern edge of site close to highway.	Yes >75%	No	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development		Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8, 12 and 15)	Yes Recommendations relating to: Detailed design and location of processing plant so as to minimise flood risk within the site or elsewhere Scope to deliver multi-functional restoration scheme Potential cumulative impacts associated with concurrent working No impacts to existing flood defence infrastructure as a result of the development However these issues are covered in Policies DM 4,8,12, 14 and 15 of the Plan.

Egginton	Sand and gravel	40	1.8mt		X 100%	X 100%		No	Yes LR/MR/HR Localised along ditches and field boundaries	Yes 50-75%	Yes Hilton Brook River Dove adjacent.	No. Minerals can only be worked where they are found. Sand and gravel sites are frequently located in fluvial floodplains and are classified as 'water compatible' development	No Operator would need to install new processing facilities. Site located entirely within FZ2 and FZ3a. Mineral processing considered appropriate in FZ2 and 3a. may be opportunities to appropriately design and locate plant within the site.	Sand and gravel extraction is water compatible development and therefore sustainable in the long term and so there is no need to seek opportunities to relocate development to more sustainable locations However, there is potential to incorporate beneficial improvements to flood capacity as apart of site restoration (covered in DM policies DM8,12 and 15)	No Not required for water compatible development NB: Development should not increase flood risk elsewhere and sites need to be designed, worked and restored accordingly (covered in policies DM1, 4, 8,12 and 15)	No Scored less well than other sites in the site assessment methodology, particularly in respect of ecology, archaeology and strength of landscape character.
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