Non-Technical Summary - Table 5 - Regulation 25 Response – Appendix 10 - Updated Mitigation Summary - December 2025.		
Issue	**Effect**	**Mitigation**
Scope of the assessment.	Existing permitted quarry operations	The existing permitted quarry phases are incorporated within this application to make it easier to permit the proposed extensions and incorporate that which is already permitted into a single permission. This assists the planning authority and the operator as it regulates all mineral extraction activity in a single consolidating permission. The existing quarry operations already have planning permission and require no further assessment other than addressing any cumulative effects. The mitigation measures relating to those working areas are already accepted, thereby setting a baseline, default, onto which the proposed extensions can be added. The mitigation measures set out below therefore, consider only those matters that arise out of the two quarry extensions. This summary addresses only those locations where likely significant effects have been identified. Where effects are not considered to be significant, no targeted mitigation is provided. However, in many such cases, those

		receptors will benefit from mitigation measures designed to protect receptors that are more significantly affected.
Landscape and visual impact.	Landscape character and features	Mitigation would include reinstating locally characteristic landscape elements which would relate well to the overall existing landscape character of the area. The retained hedgerows would also be enhanced to be species-rich with additional planting of native trees. Where appropriate, margins of up to six meters may be fenced around hedgerows to create an unmanaged, uncut, or unfertilised grassland strip. New areas of woodland and hedgerow would be planted in accordance with species lists approved for the existing quarry. These would use locally appropriate native deciduous species from the NVC Woodland W8 list, sourced locally wherever possible. All species are in keeping with the character of the area.

		The hedgerows would include the planting of native species with a variety of berry and seed-bearing shrubs New areas of grassland (calcareous/neutral) would be established in accordance with the details approved for the existing quarry. Areas of cliffs and rock piles, scree, cracks and hollows would be left to natural regeneration. Over time, this is likely to regenerate into sparse calcareous grassland habitat. Enhancement and extension of existing public rights of way.

	Visual Impact	Establishment and management of 30ha of landscape buffers around the perimeters. Landscape buffers at NW Land would include the creation of new screening landform within the northern standoffs along Stamford Road The retention and management of 3.2km of perimeter hedgerows and 9ha of woodland along the eastern boundary, including Shacklewell Hollow SSSI Phased working of Field 14 into a total extraction area of 36.2ha and management of 4.6ha of landscape buffers around the perimeters. NW Land extension to be worked initially from the south side of the site, then working towards the north-west would retain the central ridge line and help to conceal views from the north for as long as possible. Additional screening along the Stamford Road and hedgerow management to form a thick roadside barrier. formation of bunding, opposite to the residential properties along the road (Shacklewell Lodge, Shacklewell Cottage and Home Close) Field 14 to be worked initially from the north side of the site to retain the higher plateau edge and conceal views from the south for as long as possible.

		Temporary storage mounding along the Empingham Road may offer additional beneficial screening. Additional screening along the Empingham Road. Formation of bunding around the rear of the nearby residential properties (Wytchley House), along the road and along the southern boundary A new access road will be installed below ground level in the NW Land to screen it from view.
Landscape Environmental Management Plan	LEMP	The proposal includes a draft LEMP, which sets out the landscape management proposals that set out how the site will be developed and incorporates various sensitive mitigation strategies proposed, particularly for ecology and landscape features.

Soils and agriculture	Potential loss of best and most versatile soils	Best and most versatile land occurs in small, isolated patches across the two sites. In Field 14, the restoration topography is such that restoration of the land to arable use is not practical due to the steep sides. All soils stripped from Field 14 will be retained, stored and used in the final restoration but it is unlikely that best and most versatile restoration will be achieved in Field 14 due to the changed topography. In NW Land, the same approach is taken to stripping and storing soils, but the final restoration is suitable for arable use and soil resources can be replaced and BMV status can be recreated. The sub best and most versatile areas will return to the same grade agricultural land, with other areas of biodiversity being created to achieve the biodiversity net gain targets. All soils will be handled in accordance with best practice and retained for use in restoration.[1]
Ecology		Environmental elements have been considered during the development of the restoration scheme to avoid and reduce potential impacts on biodiversity. This approach has led to a range of mitigation measures capable of reducing the magnitude of impacts being embedded within the restoration design or

[1] The Institute of Quarrying - Good Practice Guide for Handling Soils in Mineral Workings - https://www.quarrying.org/soils-guidance

		captured within the proposed construction practices. Measures specifically related to the protection of ecological sites, habitats and protected species are detailed below.
Ecology - Field 14	**F14 Habitats**	
	Woodland Habitats	The loss of woodland will be replaced and further enhanced by increasing the woodland available in Field 14. The creation of new woodland will include species such as small-leaved lime (tilia cordata), sessile oak (Quercus petraea) and silver birch (Betula pendula). All species chosen are in keeping with the character assessment of the area.
	Grassland Habitats	The loss of grassland (arable field margins and IG1) will be mitigated through the creation of large expanses of grassland around the peripheries of Field 14. The restoration proposals also include exposed limestone, which over time is likely to regenerate into calcareous grassland habitat. The grassland will be seeded with a local, native, appropriate seed mix.
	Hedgerows	The restoration scheme includes the plantation of species-rich hedgerows with trees within the centre of Field 14. The retained hedgerows will also be enhanced to species-rich with trees.

		The created hedgerows will include the planting of native species with a variety of berry and seed-bearing shrubs and will be locally sourced, if possible.
	<u>Priority Species</u>	
	Great Crested Newts	Mitigation for the loss of suitable GCN habitat will include the advanced planting of woodland around the site boundaries (both Field 14 and NW Land) and the phased creation of suitable terrestrial habitat, such as woodland, hedgerows and grassland. This will not only enhance the Field 14 area but will also strengthen connections into the wider landscape, including other waterbodies. Best practice working methods in regard to GCN will be detailed within the Construction Environmental Management Plan (CEMP). It is assumed that specific mitigation related to the GCN licence for the Field 16 application will be applicable in some areas across the site.
	Bats	To mitigate the unavoidable loss of habitat value to roosting, foraging and commuting bats across Field 14, woodland, trees, hedgerows and grassland,

		in keeping with the character assessment of the area, will be planted as part of the restoration proposals. Best practice working methods regarding bats will be detailed within the CEMP.
	Badgers	Due to the presence of active badger setts within Field 14, a Natural England licence to interfere with a sett will be required, once planning permission has been granted. Detailed mitigation measures will be outlined as part of the licence application. Best practice working methods regarding badgers will be detailed within the CEMP.
	Wintering Birds	There is proposed woodland and hedgerow plantation. Species should be planted that hold winter berries which are a valuable food source for dunnocks, linnets, fieldfare, and redwing. There is also a seasonally grazed slope of grassland, this will provide suitable foraging habitat for linnets.

	Breeding Birds	Any retained hedgerows should be managed and ensure a thick base and coppicing or laying method should be used. Introduce small plots of wild bird cover to provide a seed-rich habitat. For further species-specific mitigation, see Table 14 in ES Ecology Technical Appendix 1.5. Nest boxes should be provided within retained hedgerows/trees to mitigate for the loss of on site hedgerows. This will also encourage important species onto Field 14 post-development from within the local area. Tree and hedgerow planting will increase the nesting opportunities within the Field 14 area due to the overall net increase in this habitat type. It is recommended that the proposed grassland is seasonally grazed to provide a suitable nesting habitat for farmland birds by managing the grassland sward height. It is recommended that within the woodland habitat, a thick understory is established quickly, and any deadwood should be left in situ to allow ground-dwelling invertebrates to thrive, providing a good food source for song thrush and other woodland species. Any woodland habitat management should be avoided between March and August.

		For further species-specific mitigation, see Table 14 in ES Ecology Technical Appendix 1.6.
Ecology – NW Land	**NW Land Habitats**	
	Woodland (including deciduous woodland and broad-leaved semi-natural woodland)	The loss of woodland will be replaced and further enhanced by increasing the woodland available on site. The creation of new woodland will include species such as small-leaved lime, sessile oak, rowan, gorse, bramble and silver birch. All species chosen are in keeping with the character assessment of the area.
	Grassland Habitats	The loss of grassland (arable field margins and improved grassland) will be mitigated through the creation of grassland around the peripheries of NW Land. The grassland will be seeded with a local, native, appropriate seed mix.
	Hedgerows	The restoration scheme includes the plantation of species-rich hedgerows with trees within the centre of NW Land. The retained hedgerows will also be enhanced to species-rich with trees.

		The created hedgerows will include the planting of native species with a variety of berry and seed-bearing shrubs and will be locally sourced, if possible.
	NW Land Priority Species	
	Bats	To mitigate the unavoidable loss of habitat value to roosting, foraging and commuting bats across the NW Land, woodland, trees, hedgerows and grassland, in keeping with the character assessment of the area, will be planted as part of the restoration proposals.
	Badgers	Due to the presence of active badger setts within NW Land, a Natural England licence to interfere with a sett will be required, once planning permission has been granted. Detailed mitigation measures will be outlined as part of the licence application. Best practice working methods regarding badgers will be detailed within the CEMP.
	Birds	Additionally, hedgerows, woodland, arable field margins, agricultural land, and neutral grassland are proposed across the NW Land area, increasing the

	Wintering Birds	amount of suitable habitat and also strengthening connections to the wider landscape. Mitigation for the loss of suitable bird habitat will also include the enhancement of the existing hedgerows within the NW Land area. Any gaps within the hedgerow will be filled with native berry and seed-bearing species. There is proposed open mosaic of habitats, including some conservation grazed grassland, which will hold foraging opportunities. The mitigation should be applied with planted areas of species that hold winter berries, which are a valuable food source for farmland bird species. Weedy over-wintered stubbles are the most beneficial winter-feeding habitat for skylarks (and other wintering bird species) on agricultural land. It is recommended that within the woodland habitat, a thick understory is established quickly, and any deadwood should be left in-situ to allow ground-dwelling invertebrates to thrive, providing a good food source for song thrush and other woodland species. Any woodland habitat management should be avoided between March and August. For further species-specific mitigation see ES Ecology - Table Technical Appendix 1.5.15

	Breeding Birds	Any retained hedgerows should be managed to ensure a thick base, and coppicing or laying method should also be used. Introduce small arable fodder crops or small plots of wild bird cover to provide a seed-rich habitat. Additionally, where possible margins of up to six meters can be fenced around hedgerows to create an improved grassland that is unmanaged, uncut, or unfertilised. This can be cut on a bi-annual basis after the 31st of August. This will ensure that there are seeds available for the majority of the year. Additionally, spray and cultivate as late as possible as this will provide important winter-feeding habitat on cropland (applies for all bunting species). Short-term mitigation could involve the erection of nest-boxes on maintained trees within the eastern woodland belt. It is proposed that any new grassland areas within the landscape buffer should be managed to have a minimum sward height of 60cm to benefit ground nesting bird species. For further species-specific mitigation see ES Ecology Table 15 in Technical Appendix 1.6.

	Invertebrates	Notable invertebrate species that were recorded within the site boundary included grizzled skipper and dingy skipper. All of which are protected under section 41 under the NERC Act 2006 and UK BAP priority species, respectively. The proposed works may require the temporary disturbance to areas of suitable invertebrate habitat (specific flora species are detailed in Table 15). To mitigate the temporary impacts to invertebrates, most notably the species aforementioned, it is recommended that the following measures are adhered to during construction of the pods: • Retention of sloping grassland areas, woodland and also targeting the retention of the foodplant species mentioned in the further botanical surveys (Table 15). • Retention of suitable flora species (Table 15) for grizzled skipper and dingy skipper larvae (caterpillar); and • ECoW in areas of suitable habitat (Table 15) which will be impacted by construction is recommended.

Additional Mitigation

Habitats

Table 15: Notable invertebrate species recorded within the site boundary and their favourable flora that were noted within the site.

Species	Preferable Habitats	Preferable Flora Found Within Northwest Land
Grizzled skipper	• Woodland (rides and clearings); • Arable field margins	• Bramble (frequent throughout woodland and hedgerows); • Dog rose (frequent throughout hedgerows); • Common birds foot trefoil (within improved grassland area)
Dingy skipper	• Woodland (rides and clearings).	• Common birds foot trefoil (within improved grassland area).

A LEMP has been produced. This will ensure ecologically sensitive practices are used and that the long-term ecological value and condition of the habitat type is met and maintained.

To avoid impacts to retained hedgerows and trees, extraction will be undertaken in line with BS5837:"012, "Trees in relation to design, demolition, and construction – recommendations" to avoid damage to Root Protection Areas (RPA) of retained hedgerows and trees.

To ensure no opportunistic reptiles are harmed during the clearance works, it is recommended that clearance of suitable habitat is undertaken in

		temperatures above 5°C. If a reptile is noted during the habitat clearance, all works must cease, and the reptiles should be left and allowed to move to safety. The impact avoidance methods will be detailed within the CEMP.
	Reptiles	In line with planning policy, which requires developments to enhance Field 14 for reptiles, it is recommended that: • Artificial habitat features should be created, including Log and brashpiles; and • Artificial hibernacula.
	Bats	It is recommended that prior to each phase, Potential Roost Feature (PRF) inspection surveys are undertaken on any tree with moderate to high suitability to support roosting bats, which may be impacted by the proposed works. This will involve the use of tree-climbing or access equipment to gain access to PRF's to assess in more detail their likely suitability and to look for evidence of bats. If these PRF are verified as moderate or high suitability for bats, further nocturnal surveys will be necessary to determine the presence/absence of any roosting bats, and the characterisation of any confirmed roosts.

		If a bat roost is identified within any of the trees to be impacted, a Natural England mitigation licence will need to be obtained. All works and mitigation measures will be followed as detailed within the licence. If tree removal cannot be avoided and the trees were assessed as having low suitability to support roosting bats, it is recommended that these trees are soft felled to minimise any potential impacts to roosting bats. Soft felling involves removing each limb/section of the tree, placing it on the ground and leaving it grounded overnight to allow any opportunistic bats to fly to safety. To ensure that bats continue to use the commuting and foraging features that are to be retained and created in advance of the works, any new lighting used within the scheme should be kept to a minimum and carefully designed in order to prevent light spilling onto important foraging and commuting features. The following key considerations should be adhered to: • A 2m dark buffer from any suitable bat habitats should be maintained throughout the works. • LED luminaries should be used, where possible. • A warm white spectrum should be adopted to reduce the blue light component.

	Badgers	• All lighting should be cowled and directional to the areas of works only; and • The times during which the lighting is on should be limited to provide some dark periods, particularly during the peak in bat activity (20:00 – 23:00hrs between April and September). Management prescriptions for the protection of badgers during the construction will be detailed within the CEMP at the detailed design stage and will include the provision of ramps within open excavations to avoid badger entrapment and appropriate storage methods for potentially harmful chemicals. Due to the activity of badgers within either extension area it is recommended that a pre-commencement badger survey is undertaken every year. If it is determined that the badger sett remains active or that additional setts are discovered, it will be necessary to apply for a licence from Natural England to allow the closure of both the main sett and outlier sett. Badger sett closure under a licence is constrained by timings and as such, licences are not normally issued during the badger breeding season (November to June, inclusive). To ensure that sufficient information is gathered to apply for a licence from Natural England, it is recommended

		that an Extended Badger Survey is undertaken, and territorial evidence of clans be determined, through bait marking. This will provide the baseline information required for a licence application and the type of mitigation that will be required.
	Other Mammals	Management prescriptions for the protection of other mammals during the construction will be detailed within the CEMP at the detailed design stage and will include the provision of ramps within open excavations to avoid mammal entrapment and appropriate storage methods for potentially harmful chemicals.
	Birds	To avoid the damage or destruction of nests and/or eggs of wild birds, any clearance of suitable nesting habitat will be undertaken outside the nesting season (March – August, inclusive) or following confirmation of the absence of nesting birds by a suitably qualified ecologist. These impact avoidance methods will be detailed within the CEMP.

Enhancements	Invasive Plant Species	There was no report of invasive plant species within either extension area however, it is important that the proposed development ensures that the site remains as such.
	Additional Habitat Opportunities	New habitat creation will provide opportunities for species confirmed to be present within both extension areas at baseline. In addition to these enhancements which are embedded into the proposed works, a range of additional ecological enhancement measures will be delivered as part of the proposed development, as identified below. Further details will be set out in a Biodiversity Action Plan at the detailed design stage. However, as an indicative guide: • Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats, and fruit bearing varieties to benefit birds. • Provision of new bat roosting opportunities (i.e., bat boxes). These will be a purpose built, durable and long-lasting variety such as available from 'Schwegler or 'Habitat' or equivalent. • Provision of new bird nesting opportunities (i.e., nesting boxes). These will be a purpose built, durable and long-lasting variety such as available from 'Schwegler or 'Habibat' or equivalent.

		• Skylark Plots. Are considered for inclusion within another part of the approved restoration areas / under client owned agricultural land, where suitable. • Beetle Banks. Within fields greater than 0.2 square kilometres to provide nesting cover and over-wintering habitat for beneficial insects. Beetle banks are two-metre grass strips through the middle of arable fields; and • Creation of log piles and/or brash piles to provide hibernacula for reptiles and amphibians
Construction Ecological Management Plan (CEMP)	CEMP	To reflect the various recommendations in the ecology section of the ES, a **Construction Ecological Management Plan (CEMP)** will be employed as part of a planning condition. A draft CEMP submitted – entitled '*draft Construction Ecological Management Plan for the Proposed Extensions to Grange Top Quarry* – October 2025 – prepared by Felstone Consulting. Appendix 8 of the main Regulation 25 Response includes a draft CEMP.
Archaeology	Effects of working on archaeological features	No scheduled or other designated heritage assets or monuments will be affected by the proposals, but a small number of archaeological sites have been identified as a result of the desk-based assessment, geophysics and an extensive trial trenching exercise carried out across the site in 2023. This has identified a number of Iron Age sites which will require recording to an

		appropriate level but do not appear to have a level of significance that should prevent the development from proceeding. Identified sites will therefore be excavated and properly recorded in accordance with a scheme to be agreed with the County Archaeologist under an appropriate planning condition.
	(Geo) Palaeo-archaeology	Appendix 7 of the regulation 25 Response sets out a written Scheme of investigation for assessing Paleo-archaeology.
Heritage	Effects of working on heritage assets.	One heritage asset occurs within the application area, that being a Grade II listed windmill adjacent to Field 14. The windmill sits outside the proposed development area, but inside the planning application red line. An assessment of heritage assets has shown there to be no unacceptable effects. No setting associations between any assets and the site are considered to be significantly affected and the visual screening proposals will ensure that visual impacts are reduced to acceptable levels. The blasting and ground vibration report sets an appropriate ground vibration limit for the windmill of 15mm PPV.

Highways	Access to and from the site and the local road network	The proposed site access onto the A606 has been designed as a roundabout junction. The existing site access at Pit Lane and Ketco Avenue are simple T junctions onto an A class road and operate well. A T junction onto the A606 was considered but rejected as the A606 tends to have higher traffic speeds and a larger controlled junction arrangement was considered. The visual and noise aspects of the new access road are already set out above. The A606 Stamford Road is a single carriageway road subject to the National Speed Limit in the vicinity of the site. It has a carriageway width of approximately 7.3m and is not street lit. An analysis of recent collision data does not suggest any particular road safety concerns associated with accessing the site from the A606 Stamford Road. The results of the junction capacity assessment show that the proposed site access roundabout operates with spare capacity in 2030 and 2055, inclusive of background traffic growth and with the addition of the proposed development traffic.

		Based on the findings of the report, it is considered that the proposed development would not have a severe impact on the highway network and that the proposals are acceptable from a transportation perspective. Road Safety Audit Stage 1 has been completed. A stage 2 Road safety audit will be undertaken as part of the detailed design should planning permission be granted. Section S38/278 agreements to be entered in to in due course regarding the transfer of the new sections of road that are to become public highway. i.e. the roundabout.
Public Rights of Way	Changes to and provision of new rights of way.	The site is currently crossed by two public rights of way, these being bridleway E226 that runs between the existing quarry and NW Land and footpath E229 which connects Ketton village to bridleway E226 and crosses the existing quarry. The proposals seek to expand and upgrade the local rights of way network through a combination of new routes and upgrades to existing routes. Most of these will occur at an early stage if planning permission is granted. Footpath E226 was constructed to a bridleway standard but Heidelberg does not own the northern and southern ends of it. The Council has previously asked for the path to be upgraded to bridleway status but because of the land

		ownership, this has not been a practical option. Heidelberg therefore proposes opening two new sections of bridleway, in its land ownership, which will create a bridleway that comes off Empingham Road close to the windmill, joins path E229, which will be upgraded to a bridleway. An existing track north of the existing footpath bridge will then be opened up as another section of permissive bridleway to link onto bridleway E226. This will create a bridleway that runs from Ketton Village, round the quarry and comes out at Steadfold Lane (to the east), resulting in a 6km off road bridleway linked directly to the village. These new sections of bridleway will be formally dedicated once the necessary works to convert the route from foot path to bridleway have been completed. Within restored area C3 a new bridleway will be created around the restored land approximately 1km long. This will link to bridleway E226. This will be formally dedicated once the aftercare works on C3 has been completed. In Field 13 (the windmill field), a new footpath will be created around the planted woodland and connecting to Empingham Road opposite the new permissive bridleway mentioned above. This will be formally dedicated once the path has been created. A new permissive path will be created in the landscaped/planted standoff between the proposed NW Land Bund and the A606 at Shacklewell. This path

		will run around the northern and eastern sides of NW Land, to connect with bridleway E226. The path will run outside the operational area and will be appropriately fenced. This path will be opened once the new NW Land bunds are constructed. Two further permissive paths will be created to the north of the A606, either side of Shacklewell Lodge/Farm, to connect the new permissive path mentioned above (parallel to the A606) to the existing rights of way network that link to Empingham. The intention of these two new paths is to create an off-road route between Empingham and Ketton Ketton Parish Council has asked if Heidelberg Materials could also create a mown or stoned path in the northern verge of Empingham Road between Wootton Close and the proposed permissive path in Field 13. This is in the public highway. Heidelberg Materials is willing to do this if the highway authority is in agreement. This will mean pedestrians would not have to walk in the carriageway of Empingham Road to get to the Field 13 path. A further permissive path is proposed inside Field 14 to connect Wytchley Warren Cottages to Field 13. This will connect to the Empingham Road Verge

		Path and permissive bridleway, creating an off-road route between Wytchley Warren Cottages and Ketton Village. A temporary diversion of bridleway E226 will be required whilst a new bridge and crossing point are created along the line of the existing bridleway. The new bridleway bridge and crossing point will be maintained by the applicant as they are integral to the operation of the quarry.
PROW Delivery	Delivery/Upgrade of New Rights of Way (Refer to Table 4 in the Regulation 25 Response document.)	The timing and delivery of the new/upgraded rights of way is set out in Table 4 for the main Regulation 25 Response.
Hydrology and Hydrogeology	Impact on groundwater	Mineral extraction has been undertaken since 1928 at Grange Top Quarry. To maintain continuity of supply, an application is being submitted to permit extraction within two new areas within the Application Area. These are known as NW Land and Field 14.

		NW Land is located in the northwest of the Application Area, covering 129.7 ha. The area is bounded to the north by the A606 Road, with the River Gwash located 190 m to the north. The eastern boundary is defined by Shacklewell Hollow, which is designated as a SSSI and contains a tributary of the River Gwash. The tributary is fed by springs and seepages. Field 14 is located in the southeast of the Application Area and covers 38.7 ha. The River Chater is located 1 km to the southeast. The Lincolnshire Limestones and Northampton Sand are the water bearing strata at the site and are considered to be in hydraulic continuity. The top of the Whitby Mudstone Formation forms the base of the aquifer. The watertable is located close to the boundary between the Limestone and the Sand. Where watercourses have incised down to the Whitby Mudstone, groundwater discharges from the Lincolnshire Limestone and Northampton Sand via seepage faces and springs, support nearby water features. Groundwater abstractions in the area target the Lincolnshire Limestone and Northampton Sand. The Application Area is located within Source Protection Zone 3 (SPZ3) for a public water supply, located 12 km to the east. The extension areas represent a continuation of current site operations and therefore, there is no change from the existing situation of Grange Top Quarry.

		Mineral extraction will be undertaken entirely above the watertable; therefore, dewatering will not be required. The absence of dewatering considerably reduces the risk of impacting nearby sensitive water features. Flow to Shacklewell Hollow from NW Land will be maintained, as the saturated thickness of aquifer beneath the extraction area will not be reduced. No cumulative impacts are anticipated associated with the former and currently permitted mineral extraction. The significance of the impact on the water environment during mineral extraction and 'following the completion of restoration is considered to be 'Minor'.
	Water flow and level	A Planning Condition for Grange Top Quarry requires that monitoring of groundwater elevations is undertaken regularly. The existing, comprehensive monitoring network covers the Application Area and extension areas. This will allow any changes in the groundwater elevation due to the operation of the quarry to be identified, and appropriate assessment to be undertaken.
	Water quality Hydrocarbons	The risk associated with the accidental release of hydrocarbons or other chemicals from mobile plant operating within the quarry void will be mitigated by the spill prevention and response procedures already operating at the site

		as set out below. (These are summarised in the hydrological assessment - *Appendix 3189/HIA/A3*.) i) Refuelling is undertaken by a trained operator, with routine inspections being undertaken. Operators are trained in the spill response procedure. ii) Spill kits are available for use in the unlikely event that a spillage occurs iii) The spill would be isolated to prevent further contamination. If the spillage enters the water management system, any discharge or pumping would be stopped. iv) An emergency spillage response contractor has been appointed to be contacted in the event of any incidents v) All manufacturer's maintained in accordance with best practice and the manufacturer's specification. Where possible, all maintenance will be carried out off-site or on areas of hardstanding.
Flood Risk	Potential for increased risk of flooding in the locality as a result of the quarrying activity.	Flood risks to the site from all sources are considered to be low and are summarised below:

		Mineral extraction is 'Less Vulnerable' in terms of flood risk, in accordance with the NPPF. Both Extension Areas are located on relatively high ground, away from watercourses and in areas designated as Flood Zone 1 by the EA. The small area of Flood Zones 2 and 3 that encroach onto the site are outside of the proposed extraction area. Therefore, development will not impact floodplain storage or alter fluvial flood flow paths. Pluvial flooding is regarded as a very low risk due to any risk being outside the extraction area of NW Land. Incident rainfall will be retained within the quarry void during operation and will be able to infiltrate through the base. A sump will be used where volumes of run-off require it. The risk of groundwater flooding is very low due to the highly fractured nature and good drainage characteristics of the underlying limestone and the proposal to work above the watertable. Flood risk from reservoir failure is very low for most of the Application Area, with any risk being associated with Shacklewell Hollow, which is not part of the working area. The proposed extension is not considered to pose a risk to receptors external to the site through groundwater, pluvial or fluvial flooding during extraction and post-restoration. This is due to the Extension Areas being located outside

		of designated Flood Zones and the good drainage characteristics of the limestone. It is considered that the proposed development complies with flood risk policy. The area of Grange Top Quarry identified by the Strategic Flood Risk Assessments as being within a Flood Zone is outside of the proposed working area and therefore, the Extension Areas would have no impact on fluvial flood risk.
Noise	Impact on noise sensitive properties	The site has very few residential receptors close to it. Where these do exist, screening bunds/landscaping is proposed, and phasing has been designed to provide a barrier attenuation between receptors and noise sources. The same is true of the proposed access road which has been purposefully recessed into the ground to contain road traffic noise. (The landscape section above discusses these mitigation features in more detail.) The noise report proposes limits at dwellings for site noise, based on the guidance contained within the Planning Practice Guidance and having regard to the measured background noise levels at locations taken to be representative of the dwellings selected for this assessment.

The calculated site noise levels for routine and temporary operations in the proposed working areas comply with the suggested site noise limits at all the assessment locations with the proposed bunding is in place.

The proposed operations conform to the advice set out in the Planning Practice Guidance and it is considered that the site can be worked while keeping noise emissions to within environmentally acceptable limits.

Location	**Receptor Sensitivity**	**Calculated Site Noise Level dB $L_{eq, 1 hour free field}$**	**Suggested Site Noise Limit (Routine Operations) dB $L_{eq, 1 hour free field}$**	**Suggested Site Noise Limit (Routine Operations) dB $L_{eq, 1 hour free field}$**
			Routine Operations	Temporary Operations
1. Shacklewell Lodge	High	46	55	70
2. Redland Farm	High	34	48	70
2a. Glebe Farm	High	34	48	70
3. 1-9 Stamford Road	High	34	53	70
4. Ketton Village	High	36	48	70
5. Wytchley Road/Bartles Hollow, Ketton	High	38	44	70
5a. Land off Park Road, Ketton (New housing development)	High	39	44	70

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<tr><td>6. Quarry Farm Cottages</td><td>High</td><td>34</td><td>46</td><td>70</td></tr>
<tr><td>6a. Edith Weston Road, North Luffenham</td><td>High</td><td>30</td><td>46</td><td>70</td></tr>
<tr><td>6b. Keepers Cottage, Ketton Road</td><td>High</td><td>39</td><td>46</td><td>70</td></tr>
<tr><td>7. Normanton Lodge Farm</td><td>High</td><td>34</td><td>44</td><td>70</td></tr>
<tr><td>7a. Wytchley Warren Farm</td><td>High</td><td>38</td><td>43</td><td>70</td></tr>
<tr><td>7b. Wytchley Warren</td><td>High</td><td>43</td><td>43</td><td>70</td></tr>
<tr><td>8. Hawthorn Cottage/Woodside Farm</td><td>High</td><td>43</td><td>45</td><td>70</td></tr>
</table>

For ecological receptors (notably SSSIs at Ketton quarries, Shacklewell Hollow and North Luffenham quarry), stand offs will maintain an acceptable noise environment. The Ketton Quarries SSSI already sits within the active quarry without any obvious unacceptable effect.
</td>
</tr>
<tr>
<td>Dust</td>
<td>Impact on sensitive properties from fugitive dust. –</td>
<td>Several properties exist around the quarry, all of which can be considered as sensitive receptors for dust and particulate matter. A range of measures set out below will be employed to control dust generation, such as the regular damping of internal haul routes in dry weather and the use of road sweepers</td>
</tr>
</table>

		as necessary. A dust management plan is submitted as part of the application mitigation proposals. The existing permission (2021/0796/MAF) includes a Dust Minimisation Scheme at Schedule 2. The dust assessment prepared by DustScanAQ includes a dust management plan, which is expected to replace the existing Dust Minimisation Scheme, as it brings dust controls up to a modern standard. Dust mitigation measures are set out in sections 3-5 of the Dust Management Plan – October 2025 – DustscanAQ - Section 3 – 5. **Mitigation includes: -**
	Weather Station	• Maintain site weather station and set triggers to identify those weather conditions when there is an increased or high risk of wind-blown dust.
	Maintenance	• Maintenance and proper operation of all plant and equipment, including fixed and mobile dust extraction and suppression equipment.

	Training	• All staff to be trained regarding the dust management plan. • Roles and responsibilities in relation to DMP to be clearly identified.
	Site preparation and restoration	• Minimise working material in dry, windy conditions. • Reduce drop heights at transfer points. • Control vehicle speeds. • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors.
	Mineral Extraction	• Wet minerals down with a water bowser if dry • Control vehicle speeds. • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors.

	On-site and off-site transportation	• Mobile plant with upward or sideways exhausts should be used. • Vehicles should keep to designated haul routes. • Unmade access roads should be kept in good repair and wetted as required. • Control vehicle speeds. • Install and make use of wheel wash for egressing vehicles. • Deploy a road sweeper on the public highway as necessary, and in the event of any spillage.
	Wind scouring of exposed surfaces and stockpiles.	• Keep stockpiles and storage areas tidy. • Wet down storage areas and yards to prevent dust emissions. • Wet down extracted materials where necessary. • Control vehicle speeds.

	Mineral handling (including conveyors and loadout)	• Wet minerals down with a water bowser if dry. • Control vehicle speeds. • Suspend operations when wind conditions would be likely to result in visible dust emissions towards offsite receptors. • Reduce drop heights at transfer points. • Inspect conveyors regularly. • Fit shrouding to transfer points where visible dust emissions may occur. • Fit return belt cleaners on conveyors
	Other	• The use of clean water for dust suppression to avoid re-circulating fine material. • High standards of housekeeping to minimise track-out and wind-blown dust.

	Monitoring	• The planting and maintenance of healthy perimeter vegetation. • Effective staff training in respect of the causes and prevention of dust. • Daily visual monitoring for signs of dust. • Maintain existing dust and air quality monitoring equipment and install new equipment as appropriate (see DMP) for Field 14 and NW Land. • Maintain records of dust in terms of volume and direction and compare to thresholds. • Implement monitoring at sensitive properties along A606 and at Wytchley Warren cottages as per table 4.3 of the DMP (see below). Note monitoring points will change dependent on the active phase of working.

Table 4.3: Suggested timeline of dust monitoring locations for each phase

Phase	Active dust monitoring locations
NW Field – Phases 1 - 4	No monitoring required
NW Field – Phase 5	DMP2
NW Field – Phase 6	DMP3
NW Field – Phase 7	DMP3
NW Field – Phase 8	DMP2 and DMP3
NW Field – Phase 9	DMP1 and DMP2
Field 14 – Phase 1	DMP4
Field 14 – Phase 2	DMP4
Field 14 – Phase 3	No monitoring required
Field 14 – Phase 4	DMP6
Field 14 – Phase 5	DMP5

Emergency response

- Particulate monitoring - PM10 and PM2.5 monitoring is proposed at key locations on the site boundary, to alleviate any concerns from local residents and enable real-time alerts to be sent to the site in the case of significant fine particulate matter emissions.

Complaints

- Prepare an emergency response procedure in the event of a major dust emission event.

Inspection and Reporting

- Maintain a compliant log and actions.

		• Record dust conditions on a daily basis along with any notifications from monitoring and maintain records for inspection.
Air Quality Assessment	General	No further mitigation is required.
Blasting and Ground vibration	General Blasting Frequency	The blasting and ground vibration assessment (Vibrock) in the ES was undertaken based on monitored blasts at the Site. The report recommends the following blast limits at sensitive properties around the Site. The report also advises on the likely effects of using differing sizes of charge in each blast. Blasting currently takes place approximately once per week and is only used for the limestone extraction. Clay, as taken from Field 14 does not need to be blasted, but the underlying limestone does. With the exception of the shallow overburden, NW Land contains only limestone. Field 14 and NW Land will be worked simultaneously but only limited amounts of limestone can be worked as and when the overlying clay has been removed. It is expected that in any year, there is only likely to be 10-12 blasts in Field 14 because of this. However, these blasts are unlikely to be spread equally across the year and are more likely to occur in short campaigns until the limestone face catches up with the overlying clay face, at which point

		limestone extraction would temporarily cease. Blasting effects around Field 14 are therefore likely to be intermittent. NW Land is expected to continue blasting at the rate of once per week throughout its life.
	Ground Vibration - Inhabited Property	Ground vibration limit is chosen that not only is perfectly safe for the integrity of structures, but also takes into account the human perception effects on adjacent neighbours. As the continuing use of the current site vibration criterion of 6 mms-1 peak particle velocity at a 95% confidence level.
	Ground Vibration - Uninhabited Property (Wytchley Warren Farm)	Wytchley Warren Farm has a noteworthy exception limit when uninhabited, as highlighted in the Planning Application 2021/0796/MAF section 30b. Continuing use of the current site vibration criterion of 50 mms-1 peak particle velocity at a 99.9% confidence level should this property be unoccupied and blasting within this vicinity be deemed necessary.

	Ground Vibration - Windmill	Continued use of the current site vibration criterion of 15 mms-1 peak particle velocity at a 99.9% confidence level for the historic windmill to the west of Ketton village.
	Ground Vibration – Motorised Highways	Continued use of the current site vibration criterion of 50 mms-1 peak particle velocity at a 99.9% confidence level for any highways to be used by motorised vehicles surrounding the NW Land or Field 14 extension areas.
	Ground Vibration – Ketton Gorse Mine	The Ketton Gorse Mine has a historical vibration limit due to sensitive structures and as such the current site vibration criterion of 25 mms-1 peak particle velocity at a 99.9% confidence level.
	Ground Vibration – Anglian Water Pipeline	An Anglian Water pipeline is situated directly to the north of the NW Land and, as discussed in Vibrock's report on the matter, in line with that report, the following vibration criterion are considered appropriate - 25 mms-1 peak particle velocity at a 95% confidence level for any blasting operations within this vicinity. The monitoring point will be on the land's surface at the most

		accessible point, directly above the pipeline route, the closest point to the blast.
	Air Overpressure	Vibrock advise that past experience of air overpressure measurement leads them to the firm conclusion that it is totally impracticable to set a maximum air overpressure limit, with or without an appropriate percentile of exceedances being allowed, simply because of the significant and unpredictable effect of variable weather conditions. This point is recognised by the DETR publication The Environmental Effects of Production Blasting from Surface Mineral Workings and British Standard 6472-2: 2008. With a sensible ground vibration limitation, the economics of safe and efficient blasting will automatically ensure that air overpressures are kept to reasonable levels. Vibrock therefore recommend that, in line with the current best accepted modern practice in the extraction industries that safe and practical measures are adopted that ensure the minimisation of air overpressure generated by blasting at source, considering such factors as initiation technique.

	Monitoring and Control	The mineral operator should design blasting operations and the programme of blast monitoring at the site should be continued.
	Blast Size	Blasts at the site have been calculated using an assumed instantaneous explosive charge weights of up to 77 kg. In practice, the Site currently uses a slightly smaller charge weight than this. It is likely that during the working of Field 14 Phase 5 (which is close to Empingham Road, Wytchley Warren Cottages, Wytchley House and the Windmill), a reduced charge size will be necessary. The Vibrock assessment report in the ES includes Table 3.1-3.6 sets out the maximum instantaneous charge weights to comply with the proposed blasting limits. In some cases, blast limits between sensitive receptors overlap, so for development control purposes, it is better to define blasting limits for types of sensitive properties rather than trying to specify the size of charge for each blast. For the avoidance of doubt, where overlaps of sensitive receptors occur, the lesser ground vibration limit will apply.

Soils and agriculture	Soil Stripping and Storage	Stripping should only take place in the drier parts of the year (between May and October) and avoided during or just after heavy rainfall. Soil handling will be undertaken when soils are sufficiently dry to be friable. Soil resources should be stored separately in low bunds (no more than 3 m high for topsoil). Topsoil should be stripped from areas designated for storing subsoil. The bunds should be constructed either by excavator or bulldozer (Sheets 2 and 14 in the MAFF Good Practice Guide), avoiding over- compaction. They should be sown with grass to help maintain biological activity and prevent water erosion. The soils should be removed from storage (Sheet 3 in the MAFF Good Practice Guide) and replaced by an excavator during the summer using the loose tipping technique (Sheet 4 in MAFF Good Practice Guide), which avoids traffic on the restored surfaces.
	Restoration Proposals	The proposed restoration comprises quarry floor areas being restored to arable and pasture land, with natural regeneration on quarry slopes. The

		main requirements to ensure land restoration to similar agricultural quality (subgrade 3b) are: A) sufficient depth of soil to allow cultivations and B) adequate drainage to prevent wetness limitations Restoration of topsoils to a minimum depth of c. 300 mm (TS1 or TS2) would ensure land is capable of cultivation, and effectively reuse all of the topsoils on site. Soil moisture supply (and crop yields) would be increased if permeable/rootable material can be placed below the topsoil, ideally to a thickness of 900 mm, although 300 mm of material may be sufficient. This material could include excess subsoil (SS1) and quarry fines/overburden material. Clay subsoil (SS2) will be reused in restoration on peripheral and non-agricultural areas, to avoid water logging in restored farmland.