

My Ref: TAR-014-M

Your Ref: Draft Plan Consultation

Date: 27th September 2018

Planning Policy Team
Nottinghamshire County Council
County Hall
West Bridgford
Nottingham
NG2 7QP

Dear Sir/Madam,

NOTTINGHAMSHIRE MINERALS LOCAL PLAN – DRAFT PLAN CONSULTATION

Thank you for allowing us opportunity to comment on the above consultation document. We are making representations on behalf of our client Tarmac Trading Ltd (Tarmac). Tarmac have a number of existing mineral operations, handling and processing infrastructure within the County (identified below). Operations include sand and gravel operations, hard rock operations, as well as a cement depot (Barnstone). Tarmac also operate an industrial limestone operation across the County border within Derbyshire. However, there is a wider landholding containing industrial limestone resource to sustain operations longer term contained within Nottinghamshire.

Current Operations include:

- Langford Quarry – Sand and Gravel
- Besthorpe Quarry – Sand and Gravel
- Bestwood Quarry – Sherwood Sandstone
- Girton Quarry – Sand and Gravel (currently mothballed)
- Sturton Quarry – Sand and Gravel (permission implemented but inactive)
- Nether Langwith – Limestone

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- Carlton Forest – Sherwood Sandstone
- Calverton/Burntstump – Sherwood Sandstone
- Cromwell Quarry – River wharf receiving river dredgings

Tarmac responded to the Mineral Planning Authority's Issues and Options document earlier this year. In addition, Tarmac prepared a number of submissions in response to the Mineral Planning Authority's 'Call for Sites' exercise. Sites promoted to this emerging Nottinghamshire Minerals Local Plan include:

Extensions to existing operations:

- Langford Quarry - South & West Extension (planning permission issued 6th September 2018 ref no 3/16/01689/CMA) – proposed allocation
- Langford Quarry - North Extension – proposed allocation
- Besthorpe Quarry - East Extension (east of Northcroft Lane) – not proposed for allocation
- Bestwood Quarry – North Extension & East Extension (East extension currently subject to a planning Application ref no 7/2017/1491NCC under consideration by the Mineral planning Authority) – proposed allocations

Greenfield Operations

- Great North Road – North – not proposed for allocation
- Great North Road – South - not proposed for allocation
- Botany Bay – proposed allocation
- Newark/Burridge Farm - not proposed for allocation

Tarmac have reviewed the findings of the Sustainability Appraisal and the Site Assessment document. The response to Policy MP2 – site specific sand and gravel provision include comments on the findings of the Sustainability Appraisal and place doubt on the scoring and justification for non-allocation of promoted sites.

In addition to the above, Tarmac are seeking for the river wharf and mineral processing facilities at Cromwell Quarry to be safeguarded during the plan period to facilitate the unloading and processing of sand and gravel delivered by river barge, as well as river dredgings. Tarmac also wish to ensure land at Holbeck (which contains industrial limestone to serve the nearby Whitwell operations located across the County border within Derbyshire) is safeguarded within the Plan.

Background Evidence – Local Aggregate Assessment

The latest evidence base document concerning mineral demand is contained within the Local Aggregate Assessment published in 2017 (containing 2016 data).

Tarmac maintains that the LAA does not give a full portrayal of the sand and gravel demand forecast for the Plan period. The LAA would benefit from further explanation/clarification on why Nottinghamshire is showing an overall decline in sales (contrary to the majority of the East Midlands where there has been a general increase in sales). It is Tarmac's view that this decline is a combination of many factors, including:

- the exhaustion of permitted reserves and closure of production capacity without new sites/permissions directly replacing them. Cemex's new site at Cromwell is the only site replacing the closure of established sand and gravel production within the last 10 years at : Lound Quarry, Bell Moor Quarry , Cromwell Quarry (Lafarge)and Hoveringham Quarry;
- the transfer of production into neighbouring authority areas (through working at Finningley Quarry moving across the boundary to Doncaster); and
- the continued constrained production from a number of mothballed/inactive reserves due to continuing impacts from the 2008 recession.

The above factors have skewed the available, and importantly, the operational landbank. Table 2 within the LAA shows permitted reserves at sand and gravel quarries in Nottinghamshire. Sales data indicates that there is lower level of production but not necessarily that there is a lower demand. This is evidenced by the varying supply picture within Nottinghamshire and how it differs to that of neighbouring Authorities who are experiencing consistent increases in sales (see table below – data taken from the EMAWP 2016 Annual Monitoring Report). The following table also indicates the significance of sand and gravel sales from Nottinghamshire within the East Midlands region.

MPA	Total 10 year sales	10 year sales average – 2007-2016	3 year sales average – 2013-2016
Nottinghamshire	20.79	2.08	1.76
Leicestershire	11.45	1.14	1.46
Derbyshire	10.38	1.04	1.12

Lincolnshire	20.67	2.07	2.17
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In addition to sales figures indicating a decline in production (influenced by the recession and the above factors), the Mineral Planning Authority should give further consideration to anticipated future demand. It is incorrect to assume that export levels will continue at current/historic rates. The Mineral Planning Authority should review the growth projections and likely demand this will place on Nottinghamshire resources. As we indicated at the Issues and Options stage, it is likely that there will be a greater demand during the Plan period from adjoining authorities.

Leicestershire has identified a significant shortfall of some 9.53mt of resources to meet current demand over their Plan period (to 2031) as well as significant loss of long established production capacity. There are only 5 operational sand and gravel quarries in Leicestershire and all of those are currently forecast to close well before the 2031 plan end date. There are no proposed replacement sites for sand and gravel production in Leicestershire. With sand and gravel production and demand growing strongly in Leicestershire, the clearly evidenced reserve and production capacity exhaustion will have a significant impact on adjoining authorities.

The Doncaster and South Rotherham Local Aggregate Assessment 2017 is showing very low sand and gravel average sales over the past 10 years. However, there is a sharp increase in 2015 (which is understood to be linked to production at Finningley Quarry moving into Doncaster). The Doncaster LAA makes reference to a Joint Position Statement which indicates a continued reliance on sand and gravel supply from Nottinghamshire. Specific reference is made to Sturton le Steeple Quarry producing 500,000tpa. However, this is not reflective of the submission made by Tarmac as part of the Issues and Options Consultations nor the MPA's delivery schedule at Appendix 2 to the Draft Plan where production from Sturton is projected to be 100,000tpa.

The Mineral Planning Authority should be setting out clear evidence of its' co-operation with adjoining authorities regarding demand and supply scenarios for sand and gravel which are likely to have an impact on supply and demand of sand and gravel from within Nottinghamshire during the Plan period to 2036 (as per paragraph 27 of the NPPF which refers to circumstances when development needs may need to be met elsewhere).

[Draft Plan Consultation](#)

Section 2 –Overview, Vision and Strategic Objectives

Q1 – What do you think to the draft vision and strategic objectives set out in the Plan?

Paragraph 2.3 identifies the significant overlap of housing areas, business and employment between Nottingham and South Yorkshire as well as Lincolnshire, Leicestershire and Derby which is supported. However, recognition should also be made of the likely pull on mineral resources to meet the anticipated demands from these growth areas. This could be as an additional feature to Plan 1 – overview of the Plan area. Without this we consider that the plan is not positively prepared and fails to meet the tests of soundness set out in paragraph 35 of NPPF (2018).

Paragraph 2.27 identifies ‘wider issues’ which specifically refer to movement of minerals both in and out the County. Opportunities to work with other Mineral Planning Authorities to manage these movements is identified. However, these are issues fundamental to securing steady and adequate supply of mineral from Nottinghamshire and should be given more prominence throughout the document. It is considered that the cross boundary relationship with neighbouring authorities, particularly in regards to mineral supply should be identified taking into account:

1. cross boundary mineral supply from Nottinghamshire – eg to South Yorkshire, and Leicestershire in light of their identified lack of available sand and gravel resources and production capacity to meet demand over the Plan period
2. The lack of available crushed rock/limestone resource within the County and therefore the heavy reliance on import from adjoining Authority areas
3. The availability of infrastructure links - particularly good road network and therefore links to market in assisting to secure mineral supply
4. The overlap of housing, business, infrastructure and employment links with Derbyshire and Leicestershire are identified but there is currently no reference to an overlap of mineral supply issues
5. The relationship with other mineral authorities and duty to cooperate in Plan preparation should be referenced
6. The anticipated development needs for housing, employment and infrastructure provision (including HS2)

Without the above factors being taken into consideration the Plan is not effective and fails to meet the tests of soundness set out in paragraph 35 of NPPF (2018).

The Vision

In general terms we would support the Vision. However, as well as safeguarding mineral resource, in accordance with the NPPF the Plan should safeguard mineral associated infrastructure.

Strategic Objectives

Strategic Objective 1 and a locational strategy to securing mineral supply is supported. This approach maintains the spread of operations across the County and maintains a security in supply to the specific markets that these serve. As well as seeking to 'efficiently deliver resources', the objective should include 'effectively deliver' resources to ensure that operational capacity in addition to permitted reserves is available to meet anticipated demand.

The principle of Strategic Objective 2 is supported. However, as referred above, the Plan should identify the anticipated demand from adjoining Authority areas, failure to do so will render the plan un-sound as it will not meet the tests of soundness within paragraph 35 of NPPF (2018) being positively prepared or effective. As well as ensuring that sufficient resource is allocated to meet anticipated demand, ensuring that the operational capacity of sites is sufficient to meet anticipated demand.

Strategic Objective 4 should make reference to ancillary infrastructure to take account of, 'existing, planned and potential sites for the bulk transport, handling and processing of minerals, the manufacture of concrete and concrete products and the handling, processing and distribution of substitute, recycled and secondary aggregate material' as advocated by paragraph 204(e) of the NPPF.

Strategic Policies

Policy SP1 – Sustainable Development

Question 2 – what do you think of the draft strategic policy for sustainable development?

No comments

Policy SP2 – Minerals Provision

Question 3 – what do you think to the draft strategic policy for minerals provision?

The general policy on minerals provision should ensure that the Plan maximises its flexibility to respond to changes in demand. As we have advocated through previous representations, the 10 years sales average alone does not give an accurate portrayal of the demand scenario for Nottinghamshire. Closure of long established sand and gravel quarries, non-replenishment of reserves, continuing impact from the 2008 recession on production capacity and production movements out of the County have all impacted output from Nottinghamshire. The reduction in sand and gravel output over the 10 year period should not be translated into a long term reduction in demand in Nottinghamshire.

Section (a) of Policy SP2 states that the strategy will be to identify 'suitable land for mineral extraction to maintain a steady and adequate supply of minerals during the Plan period'. It is suggested that 'suitable' is unnecessary and could be removed.

Extensions to existing sites form a logical progression from an operating perspective to secure additional mineral supply and are often sustainable and avoid needless sterilisation. Tarmac encourages 'support' for extensions to ensure maximum flexibility in securing continued supply from existing operations. All sites have an operational limit/constraint which means that whilst they will continue to contribute to demand, there will be a requirement for new greenfield sites to make up any operational capacity shortfall and to provide an effective continuity when existing operations become exhausted. The lead in period for development of a greenfield mineral production site can be at least 5 years, and an overlap between existing production and replacement production is likely to be required. At some stages of the Plan Period it is therefore likely that there will be higher production capacity as the transition between existing and replacement sites takes effect. Further comments on the site specific approach to this and increasing flexibility in the Plan are found below under the aggregate provision policies.

Policy SP2, section (c) and (d) allows for other minerals development on non allocated sites providing that a need can be demonstrated and ensuring the provision of minerals remains in line with wider economic trends through regular monitoring. Reliance on the 10 year sales average influenced heavily by a recession is not likely to reflect demand during a period of economic upturn/growth particularly given the significant level of new housing and infrastructure planned for during the Plan period. The strategy for minerals within the Plan needs to ensure that there is certainty but also some flexibility and opportunity for operators to invest in the development of mineral production sites throughout the Plan period where there is a clear need for mineral supply to meet demand which cannot

otherwise be met. The annual LAA documents should be used to assist in that process.

Policy SP3 – Biodiversity led Restoration

Question 4 – what do you think of the draft strategic policy for biodiversity led restoration?

Whilst Tarmac support paragraph 3.12 and a ‘restoration led approach’ when considering mineral operations, it is considered that a biodiversity led approach/focus taken by Policy SP3 is overly onerous. As opposed to being categorical about ‘significantly enhancing’ biodiversity, the policy should be supportive where it is ‘possible’ or ‘appropriate’. The policy as worded makes no reference/acknowledgment to the beneficial use of land and the opportunities/potential aspirations of landowners to have land restored back to economic/commercial/agricultural after uses. Paragraph 3.14 goes part way to recognising that there needs to be a balance/weighting of restoration considerations but it neglects to reference the economic potential only social/recreation and environmental opportunities. This policy should be reworded to provide emphasis on a restoration focus to new mineral development without being overly prescriptive of what restoration must be. In addition, the policy makes no acknowledgement of the long term financial burden on ecological management post restoration and who has to fund and manage these areas.

Paras 3.23 to 3.25 should commence with the wording ‘If restoration allows, priority habitats ... justified and effective in delivering the Plan and strategy to reflect the comments made above.

Paragraph 3.28 discusses ‘in some cases’ restoration for leisure or agriculture may be appropriate. Leisure and agricultural restoration are the most common forms of restoration strategy. We agree with the sentiment that there are opportunities to incorporate biodiversity/habitat enhancement but there should not be emphasis on a biodiversity led approach.

Policy SP4 – Climate change

Question 5 – what do you think of the draft strategic policy for climate change?

In accordance with the NPPF, new development should be directed to areas outside of flood zones. However, the policy as worded does not acknowledge that minerals can only be worked where they are found. In the case of sand and gravel and river sand and gravels working will often fall within areas of flood risk. Notwithstanding this, the policy and sub text should acknowledge that minerals development is considered an appropriate form of development within a flood zone in accordance with the planning practice guidance, Table 2: Flood Risk Vulnerability Classification, Paragraph: 066 Reference ID: 7-066-20140306.

Policy SP5 – Sustainable Transport

Question 6 - What do you think of the draft strategic policy for sustainable transport?

Whilst seeking to support the use of sustainable modes of transport, policy should be worded to acknowledge/recognise the potential for impact upon the viability of mineral extraction.

Minerals can only be worked where they are found. The requirement to be located close to proposed markets is overly onerous. The value of the product and the availability locally will determine the distance it needs to travel. It is considered that this policy is overly onerous and discredits the geographical spread/locational strategy which is being pursued by the Mineral Planning Authority. Such an approach fails all the tests of soundness within paragraph 35 of NPPF (2018)

Policy SP5 should therefore be amended to read:

1. All mineral proposals should seek to maximise the use of sustainable forms of transport, including barge and rail where possible and viable
2. Where it can be demonstrated that there is no viable alternative to road transport, all new mineral working and mineral related development should be located as close as possible to the County's main highway network and existing transport routes in order to avoid residential areas, minor roads, and minimise the impact of road transportation.

The suggested amendments above will therefore negate the requirement for paragraph 3.42 within the policy justification. Alternative modes of transport will be supported within the provided that it can be demonstrated that to deliver it would not affect the viability/deliverability of mineral sites.

Policy SP6 – The Built, Historic and Natural Environment

Question 7 - what do you think of the draft strategic policy for the built, historic and natural environment?

Tarmac support the recognition within paragraph 3.46 that detrimental impact on the natural and built environment as a result of mineral extraction is temporary in nature and can bring about many environmental benefits. In addition, paragraph 3.51 acknowledges that in regards to heritage and cultural assets, mineral development provides major opportunities to understand the County's rich archaeological heritage.

Policy SP6 as worded is overly onerous and does not recognise the weighting of all facets of sustainable development that should be applied when considering applications for development. In regard to mineral extraction, whilst there may be potential for environmental impact, the economic benefit of mineral extraction should be afforded 'great weight' (paragraph 205 of the NPPF). In addition, the significance of impact depends on the significance of the asset it affects. Paragraph 171 of the NPPF states that Plans should, 'distinguish between the hierarchy of international, national and locally designated assets' in regards to conserving and enhancing the natural environment. Paragraph 184 of the NPPF recognises a similar approach for the historic environment in that assets should be conserved in a manner appropriate to their significance.

Paragraph 3.58 refers to Landscape Character Assessment which, 'can be used to provide special protection to a specific feature'. As we have previously advocated, whilst Landscape and Biodiversity Mapping is helpful as a baseline for looking at potential for impact, these documents cannot be viewed or utilised in isolation and the combined benefits of mineral extraction or opportunities for restoration enhancement should be afforded weight as opposed to a negative constraint to development.

Paragraph 3.63 should be deleted. As we have referred to above, mineral development can only be worked where it is found. It is also a water compatible use constituting appropriate development within a flood zone as advised within Planning practice guidance, Table 2: Flood Risk Vulnerability Classification, Paragraph: 066 Reference ID: 7-066-20140306.

Paragraph 3.66 should be deleted as issues associated with infrastructure is handled under the provisions of the Mining Code.

Policy SP7 – The Nottinghamshire Green Belt

Question 8 – what do you think of the draft strategic policy for the Nottinghamshire Green Belt.

The final bullet point of Policy SP7 should be amended. Paragraph 3.78 acknowledges that, 'it is likely that suitably designed, landscaped and restored mineral workings can be accommodated in the green belt'. Whilst it is correct that minerals development would need to meet the tests within the NPPF on green belt, a requirement for higher standards of working is unnecessary as is restoration to enhance the beneficial use of the green belt. This fails to meet the tests of soundness within paragraph 35 of NPPF (2018) as it is not consistent with national policy. Ensuring that the operation and restoration is compatible with green belt objectives is a more appropriate strategy and reflective of the NPPF.

Policy SP8 – Minerals Safeguarding, Consultation Areas and Associated Minerals Infrastructure

Question 9 – what do you think of the draft strategic policy for Mineral Safeguarding, Consultation Areas and associated minerals infrastructure?

Policy SP8 should refer to 'known' locations of specific mineral resource as opposed to 'economically important' in accordance with paragraph 204 of the NPPF. Whilst we agree that known resources should not be sterilised by non mineral development, the policy should be clearer that all Mineral Safeguarding areas will become Mineral Consultation Areas.

It is considered that the Minerals Plan would be more effective if it was to define more specific Mineral Consultation Areas. The proposed approach to define consultation areas on the same scale as safeguarding areas could mean that large amounts of development will be caught within an MSA/MCA which would be onerous on developers having to potentially submit minerals assessments and the MPA in assessing the potential for impact of development on mineral resource/mineral associated infrastructure.

As well as safeguarding mineral associated infrastructure, rail heads should be expanded to include rail heads at coal fired power stations. A wharf facility at Colwick is specifically referenced for safeguarding. Tarmac has existing river wharf facilities at Besthorpe Quarry (loading) and Cromwell Quarry (receiving) which

should also be referenced and marked on the Policies Map. The river wharf facility at Besthorpe Quarry last operated in 2013 but has been retained in a mothballed state. It is possible that the wharf facility will be put back into use and therefore it should be identified and safeguarded. Tarmac also has a river wharf facility at Cromwell Quarry which should be safeguarded within the Plan. Cromwell Quarry has been promoted at the 'call for sites' exercise for receiving sand and gravel from the Burrige Farm site near Newark. The Cromwell Quarry river wharf operates periodically for receiving river dredging, either for processing and sale or disposal within the quarry site to enhance restoration of the site. The Cromwell Quarry site is an important facility for the long term dredging operations carried out to maintain water navigation on the River Trent and the site should therefore be safeguarded for continued operation throughout the Plan period.

The importance of Local Plan's (District and Borough Council) in understanding and appreciating the role of safeguarding and defining areas/sites within Local Development Plan Documents should be explained within the Mineral Plan. The Planning system is a tiered system with the policies contained within the Mineral Plan and Local Plan pertinent to the consideration of Planning Applications at County and District level. The MPA has an important role in ensuring mineral safeguarding is not perceived as just a County function but guiding and supporting Local Authorities to appreciate they also have a role to play in accordance with the Planning Practice Guidance.

In light of the above and the identification of safeguarding areas on the policies maps Plan 4 is not required.

Paragraph 3.93 is contrary to the NPPF paragraph 204 (e) and should be deleted. Policies should safeguard all ancillary infrastructure and the NPPF does not distinguish that only strategic facilities should be safeguarded. Whilst it may be unnecessary to identify all facilities on policies maps, the policy wording itself should ensure that these facilities will be safeguarded.

Policies regarding safeguarding should make reference to the 'agent of change' identified at paragraph 182 of the NPPF. This seeks to ensure that the onus is on Applicants for new development to put in place adequate mitigation to ensure that the development would not place unreasonable restrictions on existing businesses/operations.

Minerals Provision

Policy MP1 – Aggregate Provision

Question 10 – What do you think of the draft policy approach towards aggregate provision?

The 10 years average sales figures are not the most suitable methodology for forecasting aggregate demand. National Policy states, forecasts of demand should be based on a rolling average of 10 years sales data, other relevant information and through assessment of all other supply options. The 10 years average sales are heavily influenced by the impact of the recession. In addition, the movement of production at Finningley outside the County boundary has effectively skewed the perceived sales/demand. This is particularly apparent given the picture across the East Midlands which in all other cases have seen increases in sales figures. Whilst, recycled and secondary aggregate has a role to play in meeting demand in some circumstances it cannot be relied upon for ensuring continuity in supply. In addition, given the location of the County it is unlikely that demand can be met from other sources (for example marine). Considering this, the other relevant local information is particularly important in forecasting future demand in the County. Considering the above the Mineral Planning Authority is underproviding sufficient sand and gravel resource over the Plan period. We support the MPA in their previous approach which reviewed sales data pre and post-recession to give a greater appreciation of likely anticipated demand in recession and a period of economic growth.

The operational capacity of permitted operations within the County needs consideration to ensure that anticipated demand is met. A decline in sales is not necessarily an indication of a decline in demand. Production moving outside of the County will impact upon perceived sales figures as well as sites/resource not being replaced when exhausted.

A Delivery schedule has been prepared as Appendix 2 to the Draft Plan. Tarmac have enclosed an edited version (Appendix 1a) which shows the available production capacity from existing sites and proposed allocations as proposed within the Plan against the identified annual requirement for sand and gravel. The sites proposed for sand and gravel extraction including allocations are insufficient to even meet that depressed annual requirement. An edited version is also enclosed at Appendix 1b which shows how additional allocations could assist in meeting the identified shortfall.

Although the landbank is sufficient at the start of the Plan period, sites will become exhausted during the Plan period and provision should be made for replacements.

The Plan should not focus or specify a definitive/maximum amount of mineral provision. The sales data is an indication of current demand and should not be perceived as a maximum requirement. The Plan needs to provide flexibility to support additional sites/resources coming forward during the Plan period to meet demand/operational requirements to serve existing/future markets. Policy M1 should be updated to provide a more realistic sand and gravel provision figure which is reflective of economic growth at pre-recession levels. As a minimum the policy should be clear that the provision of sand and gravel, Sherwood Sandstone and Crushed Rock are minimum requirements. Section 3 of the policy does not make any allowance for the benefit of sustainable extensions to existing operations in securing continued delivery of mineral as advocated by the Strategic Policy SP2.

Policy MP2 – Sand and Gravel Provision

Question 11 – What do you think of the draft site specific sand and gravel allocations?

Tarmac are supportive of the approach to work permitted reserves as well as allocating extensions to existing operations and through the provision of new greenfield sites. There needs to be allowance in the Plan for both extensions and new greenfield sites. However, the Plan should provide flexibility and policy should be supportive in securing extensions to existing operations, this ensures a continuation in supply without sterilising mineral reserves. Currently the Policy does not support the strategic policy SP2. This could be achieved through an additional criterion to Policy MP2 to allow for new mineral sites to come forward to continue to meet demand subject to environmental considerations. The Plan needs to build in an element of flexibility to address the issue of long term longevity of mineral operations in Nottinghamshire – only 4 sand and gravel sites identified in Policy MP2 have long term and significant production capacity.

We support the Council in adopting a locational approach to mineral development sites to ensure there is a spread in sites to meet anticipated demand. However, operational capacity constraints still apply (imposed by plant capacity, planning conditions or HGV routing agreements) which can limit production / distribution to meet demand in some market areas. These are all important considerations in locating new sites for mineral development. There should not be a sole reliance on their physical location in the County. Besthorpe Quarry and Girton Quarry (currently

mothballed) for example have vehicle movement restrictions through S106 planning agreements which forces HGV routing northward. As a result those sites are generally more aligned to the North Nottinghamshire / Doncaster / Humberside market areas as opposed to Newark.

Tarmac are very disappointed and surprised that the Besthorpe Quarry East Extension has not been included as an allocation in the draft plan. The permitted resource and proposed allocations do not at any time over the Plan period meet the proposed annual requirement for sand and gravel (1.7mt). The Tarmac revised Delivery Schedule (appendix 1a and 1b) illustrates this point. The Council is advocating an approach that gives preference to extensions to existing operations and on review of the Sustainability Appraisal and Site Assessment supporting paper, the eastern extension to Besthorpe Quarry is one of the best scoring sites in meeting the sustainability objectives. There is a very clear and compelling case for the Besthorpe Quarry East site to be allocated in the Plan.

There is also a clear case for additional allocation of green field sand and gravel sites to be allocated to come into production during the Plan period. The serious decline in sand and gravel reserves and projected production capacity in Leicestershire is clearly evidenced through the Leicestershire Mineral & Waste Local Plan review and sites have been promoted into the Nottinghamshire Local Mineral Plan review to meet that identified shortfall and the consequential need for alternative supply from adjoining authority areas. Tarmac's promoted site 'Great North Road (North)', near Kelham meets that objective and would deliver a long term sand and gravel production site with a sustainable output of 250,000 tonnes per annum to serve the Nottingham and North East Leicestershire market over the plan period to 2036. The Great North Road (North) site should therefore be allocated in the Plan.

The Great North Road (South) site has a proven significant future sand and gravel resource which would provide a natural long term extension to the Great North Road (North) site.

The combined sand and gravel resources at the "North" and "South" sites would provide a stable long term supply facility to meet the likely strong demand for construction materials in the Nottingham / NE Leicestershire markets throughout and beyond the 2036 Plan period.

In addition, Tarmac's proposed new green field extraction site at Burrige Farm, which is proposed to use river barge transportation to feed sand and gravel to a proposed new processing plant at the former Cromwell Quarry site previously

operated by Lafarge, would also provide some additional support production capacity in the second part of the Plan period. The Cromwell plant site is well situated with good access onto the A1 interchange at Cromwell. The Burrige Farm site would not have capacity to operate at high output levels due to likely physical constraints on barge transportation along the River Trent through Cromwell Lock.

Appendix 1 to this letter illustrates the productive capacity of sites within the Plan area with additional sites included as allocations. Appendix 2 to this letter includes revised Sustainability Appraisal Matrices supplemented by additional evidence where appropriate carried out as part of further site investigation work to support Screening and Scoping submissions and Planning Application documents.

Policy MP3 -Sherwood Sandstone

Question 12 – what do you think of the draft site specific Sherwood Sandstone allocations?

The LAA recognises the high level of export to markets outside the County due to limited resources elsewhere. As per comments on sand and gravel, there is a need where resource exists to maintain production and operating capacity to meet demand. The Plan should identify appropriate extensions to existing operations or new sites to meet demand. Identified demand based on sales is a minimum requirement of the Plan and there should be flexibility built into the Plan to allow sites to come forward. The plan should address anticipated demand from outside of the County. As per comments on Policy MP2 an additional criteria regarding modest extensions should be included to ensure flexibility in the Plan and to allow the continued supply of Sherwood Sandstone which is not just important within Nottinghamshire.

The Plan should recognise the unique properties of the sand as well as markets. Colour variances as well as properties of the sand are also important factors and therefore additional reserves (as allocations or new sites) should not solely be based upon estimated demand based on sales figures.

Policy MP4 - Crushed Rock

Question 13 – what do you think of the draft policy to meet expected crushed rock demand over the Plan period.

It is likely that there is a wider demand for crushed rock within the County than that met by Nether Langwith. Crushed rock requirements are likely to be met from imports to meet the demand within the south of the County to minimise the distance crushed rock will need to travel.

Policy MP5 Secondary and recycled aggregates

Question 14 – what do you think to the draft policy regarding secondary and recycled aggregate?

Support for the MPA in seeking the use of alternative aggregates and the appreciation that there are limits on how far alternatives can substitute primary aggregate. Whilst support for alternative aggregate should be encouraged in the Plan, the contribution should be viewed as a ‘bonus’ over and above the required amount of primary aggregate. This is reflective of the NPPF (para 204 (b)) which states that local Plans should take account of the, ‘contribution that substitute or secondary and recycled materials and minerals waste would make’. The reduction in ash materials from coal fired power stations is also likely to increase the demand for primary aggregate over the Plan period to address this specific resource shortfall. The approach to recycled aggregates reflects the Mineral Products Association Long Term Aggregates Demand and Supply Scenarios Paper which indicates that the potential for recycling has reached an optimum level (approximately 28-30% volume).

Policy MP9 Industrial Dolomite Provision

What do you think of the draft policy to meet demand for industrial dolomite over the plan period?

Reserves of industrial dolomite are of international importance and the resource itself is scarce with only a small number of sites within the UK. As such there will always be a need for the resource, therefore the policy should be reworded to state that:

‘Proposals for industrial dolomite extraction will be supported providing that development does not give rise to any unacceptable levels of environmental impact’.

Whilst additional resource areas do not need to be identified as an allocation, the resource within Nottinghamshire should be identified within the Plan and recognised as a proven resource to be safeguarded.

Development Management Policies

Policy DM1 – Protecting Local Amenity

Question 22 – what do you think of the draft policy wording for DM1: Protecting local amenity?

No comments

Policy DM2: Water Resources and Flood Risk

Question 23 – what do you think of the draft policy wording for DM2: water resources and flood risk?

It is considered that the use of ‘detrimentally altered’ is not an effective strategy as there is no quantifiable method by which it can be monitored, nor severity of impact measured. It is suggested that giving rise to ‘unacceptable impacts’ would be more appropriate.

In regard to flooding, criterion 3. states that *‘proposals for mineral extraction that increase flood risk to local communities will not be supported unless the risks can be fully mitigated’*. This statement appears contradictory as in cases where ‘risks can be fully mitigated’ the proposal would not ‘increase flood risk to local communities’. As such, the purpose/ intent of this statement is unclear, and it is recommended that the policy is re-worded.

Policy DM3: Agricultural land and soil quality

Question 24 – what do you think of the draft policy wording for DM3: Agricultural land and soil quality

Whilst it is correct to protect and enhance soils (NPPF paragraph 170) and therefore the best and most versatile agricultural land, the policy is not positively prepared nor an effective strategy. Minerals can only be worked where they are located and in the majority of circumstances this is in areas of countryside and often on agricultural

land. Notwithstanding this, with appropriate soil handling strategies the value of soil resource can be retained, and the land restored for agricultural purposes.

The policy should be reworded as follows:

Policy DM3: Agricultural Land and Soil Quality

Agricultural land

Proposals for minerals development located on the best and most versatile agricultural land (grades 1, 2 and 3a) will be supported where it can be demonstrated that where alternative options are limited to varying grades of best and most versatile land, the development should be located within the lowest grade where possible.

Soil quality

Measures will be taken to ensure that soil quality will be adequately protected and maintained throughout the life of the development and, in particular, during stripping, storage, management and final placement of soils, subsoils and overburden arising's as a result of site operations.

Policy DM4: Protection and Enhancement of Biodiversity and Geodiversity

Question 25 – what do you think of the draft policy wording for policy DM4: protection and enhancement of biodiversity and geodiversity?

Policy DM4 is onerous and not in compliance with the NPPF, particularly in regard to the approach on local sites. Paragraph 175 of the NPPF advises that 'if significant harm to biodiversity cannot be avoided...' Paragraph 2 of Policy DM4 should be amended to reflect the significance of harm to allow a judgement to be made as opposed to a blanket approach to all impacts. Placing populations of priority species or areas of priority habitat alongside irreplaceable habitats (criteria d) also does not distinguish between the value/significance of assets – irreplaceable habitats should be given greater weight than areas of priority habitat. The distinction needs to be made to ensure that development has the opportunity to present potential mitigation or compensation strategies as required by part 2 of the policy.

Policy DM5: Landscape Character

Question 26 – what do you think of the draft policy wording for DM5: landscape character?

Policy DM5 should reflect the guidance within the NPPF at paragraph 170 to ‘protect and enhance valued landscapes ... (in a manner commensurate with their statutory status or identified quality in the development plan)’. Paragraph 171 goes further to state that plans should, ‘distinguish between the hierarchy of international, national and locally designated sites’ It appears that the policy is seeking to place a weight on the impacts upon landscape character comparable to that of nationally designated landscapes (of which there are none in Nottinghamshire).

The wording of Policy DM5 appears confused. The policy, as worded, implies that minerals developments will only be supported if they do not result in an adverse impact on the landscape and that harmful impacts can be adequately mitigated. In situations where there is no available alternative to the development and the development outweighs the landscape interest, the policy still requires that harmful impacts are adequately mitigated.

Policy DM6: Historic Environment

Question 27 – what do you think of the draft policy wording for DM6: historic environment?

Paragraph 184 of the NPPF recognises that assets should be conserved in a manner appropriate to their significance. In regard to non-designated assets (part c of policy DM6), the Policy is not consistent with paragraph 197 of the NPPF. In the event of applications that directly or indirectly affect non designated assets, a balanced judgement is required having regard to the scale of any harm or loss and the significance of the asset. Paragraph 197 does not require there to be public benefit.

Paragraph 3.51 acknowledges that in regard to heritage and cultural assets, mineral development provides major opportunities to understand the County’s rich archaeological heritage. Policy DM6 does not currently recognise this and should refer to the NPPF requirement of assessment proportionate to the assets importance (paragraph 189).

Policy DM7: Public Access

Question 28 – what do you think of the draft policy wording for DM7: public access

As worded policy DM7 part 1 and 2 are contradictory. It is considered that the policy should be reworded as follows:

Policy DM7: Public Access

Proposal for mineral development will be supported where it is demonstrated that development does not give rise to unacceptable impact on existing rights of way and its users. Where proposals for temporary or permanent diversions are required they should be of equivalent interest and quality.

Improvements and enhancements to rights of way networks will be supported and where practicable enhanced public access to restored mineral workings will be encouraged.

Policy DM12: Restoration, After use and Aftercare

Question 33 – what do you think of the draft policy wording for DM12: restoration, after use and aftercare

Section 2 should refer to agricultural restoration. The economic long term use of land should be recognised as should the long term aspirations of landowners.

Section 4 refers to ‘satisfactory evidence’ which is difficult to quantify. It is suggested that just evidence regarding to sources of waste being available over an appropriate timescale would be sufficient.

Policy DM14: irrigation lagoons

Question 35 – what do you think of the draft policy wording for DM14: irrigation lagoons

The sub text refers to mineral ‘usually being taken offsite for processing’. This should be essential criteria as part of the policy to ensure that mineral extracted cannot substitute/replace/prejudice extraction of resource permitted or allocated as a mineral extraction site (as per part d of the policy)

Other Considerations

Monitoring

Given the concern regarding the anticipated demand for sand and gravel over the Plan period, the Plan needs to set out a very clear strategy on monitoring and review to ensure that it can respond quickly enough to changes in economic circumstances.

Sustainability Appraisal

General Comments

As we have stated as part of previous consultation responses on other MLP Drafts, the weighting of each of the Sustainability Appraisal objectives should be explained and how these will be used to assess the Plan policies and any sites promoted for allocation. Currently the SA Objectives are heavily weighted to potential environmental effect. However, economic and social facets of sustainability are critical elements relating to minerals development – i.e maintaining supply, access and proximity to market, beneficial restoration objectives, non-sterilisation of known resource by promoting extensions to existing operations etc. Attention is drawn to the NPPF and that ‘minerals are essential to support sustainable economic growth’. As well as providing an ‘adequate’ amount, the SA has failed to take account of the need to plan for a ‘steady and adequate’ supply of aggregate (paragraph 207). There is a requirement for the MPA to recognise that as well as ensuring they have a sufficient land bank of resource that the Plan maintains aggregate provision across the whole Plan period – comments above on operational capacity are particularly pertinent to this.

Site Specifics

As referred to above under the site specific Policy DM2, Tarmac have reviewed the Sustainability Appraisal for their sites and provided additional evidence where necessary to support proposed allocations (see appendix 2).

I trust that the above comments are helpful. Should you have any queries or wish to discuss any of the points raised in more detail, please do not hesitate to contact us.

Yours sincerely,


Heaton Planning Limited

Appendix 1a

The Nottinghamshire Delivery Schedule taken from the Draft Plan Appendix 2 with operational capacity shown

Appendix 1b

The Nottinghamshire Delivery Schedule taken from the Draft Plan Appendix 2 inclusive of additional sites to meet anticipated demand

Appendix 2

Revised Sustainability Appraisal summaries for Tarmac proposed allocated and non-allocated sites

Tarmac Potential Sites and Total Sustainability Appraisal Scores (combined operational and long term effects)

SITE	SA OVERALL SCORE	TARMAC SCORE
Sand and gravel		
Langford North	-8	2
Besthorpe East	-6	7
Burridge Farm	-6	-1
Great North Road (North)	-13	-3
Great North Road (South)	-12	-3
Botany Bay	-9	-1

Langford North

Sustainability Appraisal Objectives	Effect – Operational Period	Effect – Long Term	Commentary (NCC)	Mitigation (NCC)	Tarmac Comments	Revised Scoring Effect - Operational period	Revised Scoring Effect – Long Term
1. Ensure that adequate provision is made to meet local and national mineral demand.	+3	0	The size of the estimated reserves of this site would contribute very positively to meeting national and local demand for sand and gravel.	Not applicable.	Paragraph 203 of the NPPF advocates it is 'essential' that there is sufficient supply of minerals. The MPA are advocating policies where extensions to existing operations are 'preferred' on account of their sustainability merits. It is therefore considered that an extension to langford has been underscored for the positive contribution it can make to the continuation of mineral supply.	+3	0
2. Protect and enhance biodiversity at all levels and safeguard features of geological interest.	-2	+2	Horse Pool, Collingham LWS, which lies centrally within the site, is one of a declining number of such features in this part of the Trent Valley and would be directly affected. Langford Lowfields LWS is immediately adjacent to the site and could be indirectly affected during operations through noise, dust and changes in hydrology and hydrogeology. It is likely that the existing LWS within the site will be lost but it is indicated that restoration will be biodiversity-led in line with the RSPB's "Bigger and Better" concept plan for the restoration and after use of sand and gravel workings in the Trent Valley north of Newark. The restoration scheme would enhance the existing RSPB reed bed based nature reserve complex on the main Langford Lowfields quarry.	Ecological surveys and hydrological reports. Retention of Horse Pool, Collingham LWS with mitigation to ensure that it is not affected by hydrological drawdown. Buffer zones to protect LWSs.	The restoration scheme would enhance the existing nature reserve progressively created at the main Langford Quarry site over the previous 20 years.	-2	+3
3. Promote sustainable patterns of movement and the use of more sustainable modes of transport.	+1	0	As this is an extension the existing access would be utilised, which is well-related to the main highway network with direct access to the A1133.	Not applicable.		+1	0

4. Protect the quality of the historic environment, heritage assets and their settings above and below ground.	-2	I	<p>There is potential for an adverse impact on the settings of Collingham's conservation area and listed buildings. It is unlikely that there will be any adverse impact on the Scheduled Monument on the western bank of the river, given the previous quarry workings on that side of the river. The site has high archaeological potential.</p> <p>In the long-term the impact on the settings of the conservation area and listed buildings could be positive or negative depending on the nature of restoration.</p>	<p>Buffer zones and screening. Archaeological surveys to determine the nature and significance of any remains, then adequate provision to be made for preservation, excavation or recording. Metal detector on conveyor belt to seek metal objects of archaeological interest. Appropriate restoration scheme.</p>	<p>The north extension of Langford Quarry is generally remote from sensitive receptors within Collingham Village. The setting impact would therefore not be significant.</p> <p>The geophysics report (enclosed) for the site confirms that there are some areas of high potential, likely to be similar in nature to the areas assessed in 2017/2018 within the South & West quarry extension areas (which was granted planning permission on 6th September 2018).</p> <p>Archaeological investigation would continue as per the existing operations and findings would be recorded in accordance with approved Written Schemes of Investigation.</p>	-2	0
5. Protect and enhance the quality and character of our townscape and landscape.	-2	-2	<p>The landscape assessment resulted in a combined landscape score of 71/100 for the operational period so the impact is considered to be negative. The landscape assessment for post-restoration resulted in a combined landscape score of 71/100 so the impact is considered to remain negative.</p>	<p>During the operational phase there should be planting to screen views from 3 residential properties around Wharf Cottage and buffers around Horse Pool LWS, along multiple RoWs and the edge of the River Trent.</p> <p>Restoration should include provision of a network of small ponds and allow river meadowlands to be managed as flood meadow grasslands.</p>		-2	-2
6. Minimise impact and risk of flooding	-3	I	<p>The site is located within Flood Zone 3 (high flood risk area) and the functional flood plain. Sand and gravel workings are considered to be water compatible development which is appropriate in this zone provided that there is no net loss of floodplain storage, water flows are not impeded and flood risk is not increased elsewhere. There is insufficient information at this stage on which to determine the impact of operations and as it is a high risk zone the effect has to be considered as very negative. Impact in the long-term could be positive</p>	<p>Meeting the requirements of the Environment Agency, including no excavation within 45m of the River Trent or flood defences. Flood Risk Assessment (FRA) including consideration of flood flow and storage. Implementation of SuDs.</p>	<p>This takes an unnecessarily negative stance on the potential for impact. As advised mineral operations are water compatible and flood resilience and compensation would be incorporated as part of any restoration proposals as per the existing approved restoration scheme. This also provides opportunity for</p>	-1	+1

			or negative depending on the nature of restoration.		<p>longer term benefits.</p> <p>Working of operations has to consider the potential for flood impact and this would continue within an extension area.</p> <p>The installation of the outfall sluice from the restored wetland in the main quarry workings now enable flood inundation water to be quickly evacuated by gravity drainage. The extended mineral working areas will also benefit from this facility, enabling the mineral extraction areas to operate as an effective flood water storage facility.</p>		
7. Minimise any possible impacts on, and increase adaptability to, climate change.	?	I	During the operational phase the effect would be dependent on the details of operation, e.g. whether the most energy efficient plant and machinery were used. Thereafter, in the long term, the effect could be positive or negative in terms of increasing the resilience of flora and fauna to climate change depending on the details of restoration.	Implement restoration which provides appropriate habitats to help to increase the resilience of flora and fauna.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently	0	0
8. Protect high quality agricultural land and soil.	-1	-1	42% of the site area is Grade 3a which is best and most versatile agricultural land and 58% is Grade 3b.	Restoration of an appropriate proportion of the site to high quality agricultural land if that is possible.	Good soils management strategies would ensure that the best and most versatile agricultural soils are retained and reused in restoration where possible	-1	-1
9. Promote more efficient use of land and resources.	+1	-1	More efficient use of land would result from an extension, which could utilise the existing site's infrastructure.	Not applicable.	The extension area would ensure that mineral resource is not needlessly sterilised. This would promote the long term efficient use of land and resources.	+2	0
10. Promote energy efficiency and maximise renewable energy opportunities from new or existing development.	?	?	Effect would be dependent on the details of operation, such as the use of energy efficient plant and machinery and renewable energy sources for on-site power.	Not applicable.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently	0	0

11. Protect and improve local air quality.	-3	0	Operations would create dust. The mineral would be exported by HGV with an estimated 164 two way movements (82 HGV arrivals and 82 HGV departures) per average working day.	Environmental protection measures to reduce dust.	There is a current operation in place which does not give rise to dust nuisance/complaint. The extension area would utilise existing dust mitigation practices and therefore during the operation phase the effect is likely to be minimal.	-1	0
12. Protect and improve water quality and promote efficient use of water.	-1	0	Potential de-watering and discharge into watercourses.	Hydrological reports. On-site protection measures to avoid contamination of surface waters and groundwater. Implementation of SuDs. Meeting the requirements of the Environment Agency and Internal Drainage Board (IDB).		-1	0
13. Support wider economic development and promote local job opportunities.	+3	0	This site has the potential to produce a very large quantity of aggregate which is important in supporting the wider economy particularly through meeting the demands of the construction industry. There is also the potential for creation of some local job opportunities.	Not applicable.	NPPF paragraph 205 advocates 'great weight' to be given to the benefits of mineral extraction including to the economy. Whilst local jobs will be created the longer term effects of mineral extraction in providing essential housing and infrastructure requirements should be recognised.	+3	0
14. Protect and improve human health and quality of life.	-3	+2	There are settlements in close proximity to the site so during the operational phase there could be a negative effect resulting from noise, dust and traffic. In terms of visual amenity, there are distant views from a few adjacent properties [REDACTED]. There are rights of way within the site and partially along the eastern boundary. Disruption of these RoWs would add to the negative impact. There is potential for long term benefits through restoration allowing for public access and linking into the RSPB's 'Bigger and Better vision' for landscape scale delivery of wetland habitats.	Environmental protection measures to reduce noise and dust. Transport Assessment. Buffer zones and screen planting. Protection/re-routing of RoWs. Public access opportunities as part of restoration scheme.	The extension area is generally remote from residential property. Impact of rights of way would be temporary, with opportunity for significantly enhanced public access around and through the proposed extended nature reserve.	-1	+3
Total	-9	+1				-2	+4

Scale	Likely effect on the SA Objective
+3	The proposal is likely to have a very positive impact
+2	The proposal is likely to have a positive impact
+1	The proposal is likely to have a slightly positive impact

0	No significant effect / no clear link
?	Uncertain or insufficient information on which to determine impact
1	The proposal could have a positive or a negative impact depending on how it is implemented
-1	The proposal is likely to have a slightly negative impact
-2	The proposal is likely to have a negative impact
-3	The proposal is likely to have a very negative impact

**LANGFORD QUARRY
NORTHERN EXTENSION AREA**

**Archaeological Geophysical Surveys
2017-18**

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LANGFORD QUARRY NORTHERN EXTENSION AREA COLLINGHAM, NOTTINGHAMSHIRE

Archaeological Geophysical Surveys 2017-18

Abstract

A programme of geophysical investigations has been undertaken across an area of land which has been proposed as a future extension site adjacent to the existing Langford Quarry near Collingham, Nottinghamshire. The purpose of the surveys was to provide information relevant to an ongoing archaeological evaluation of the extension site.

The geophysical work has included both a magnetometer survey capable of testing for evidence of archaeological features or remains, and an electromagnetic conductivity survey. The EM survey responds to the presence of alluvial soils, and has identified a number of potential palaeochannels. The surveys were carried out over an extended period in 2017-18, as determined by crops, land access and other factors. The surveys have identified a number of previously unidentified archaeological sites and findings as noted below.

1. Introduction

The magnetometer and electromagnetic (EM) surveys were commissioned from Bartlett Clark Consultancy, Specialists in Archaeogeophysics of Oxford, by Archaeologica Ltd on behalf of Tarmac Ltd. They covered areas as outlined in red and yellow respectively on the location plans shown in figure 1.

The magnetometer fieldwork was started in November 2017, and much of the EM work was done in February-March 2018, but a number of fields remained heavily ploughed throughout a prolonged period of wet weather, and could not be surveyed for some months until they were cultivated. The fieldwork for both surveys was completed after the final field was cultivated in late May 2018. Data plots showing interim magnetometer results were supplied during the course of the fieldwork, and are now included as part of a full presentation of the findings in this report.

2. The Site: Location and Topography

The proposed extension site extends for some 2km north to south across an area of riverside arable farmland at an elevation of c. 8-9m AOD. The site is centred approximately at NGR SK811617, and is located about 1.5km west of Collingham. The northern part of the site is bounded to the west by the River Trent, and to the north by Besthorpe Quarry. Previously worked areas of Langford Quarry adjoin the southern part of the site to the south and west. Fields within the evaluation area are numbered in an arbitrary sequence (1-17, as indicated on the survey plans) for identification in this report.

The area initially proposed for survey coverage in 2017 was the northern part of the final survey area. The scope of the investigation was extended early in 2018 by the inclusion of an additional area to the south marked as Carlton Ferry Lane in figure 1. This gave a final total evaluation area of approximately 119 ha. The EM survey area (as determined following preliminary revisions) is located within the wider evaluation site, and amounts to c. 75 ha. In each case substantially complete coverage of the specified areas was obtained, with the exception of limited areas planted for cover, or which were overgrown. A piece of densely overgrown and heavily rutted set-aside land is labelled as field 4 towards the north-west of the survey. A photograph of this area is shown alongside the magnetometer plot in figure 14.

The geology of the site (as indicated by the BGS website) consists of alluvium and sand above a bedrock of Triassic Mudstone. A plan by Trent and Peak Archaeology from a report on the geomorphology of the site prepared in connection with a previous quarrying proposal in 1993 is shown inset in figure 3 [1]. This report (based on auger data and soil studies) identifies a gravel island (also mapped by BGS) at the east of the present evaluation area, with alluvium to the west. The report suggests the alluvium is thickest in a north-south band through the centre of the site, which conforms substantially with the EM findings from the present survey.

A further indication of some of the main areas of alluvial deposition (and the locations of palaeochannels) is provided by the Lidar image (based on Environment Agency data, and supplied to us by Archaeologica Ltd) which is shown inset in figure 4. The Lidar evidence is broadly consistent with the EM findings, as noted below.

3. Archaeological Background

The locations of previous comparable nearby surveys are shown on the 1:40000 map extract inset in figure 1. These provide an indication of the archaeological potential of the site and its surroundings. The Besthorpe survey (2 on plan) was done in 2017 [2] and covered an area of 35ha at a site c. 1 km north-east of the present survey. This produced few archaeological findings, but surveys done around Langford Quarry to the south in 2016-17 [3-5] were more productive. A substantial and previously unidentified settlement site was detected at the south of the Langford West survey [3], and a clear outline of the scheduled Roman Camp cropmark site was obtained in a survey in 2016 [5]. EM surveys of the Langford West and South sites also detected a number of palaeochannels.

No substantial cropmarks appear to have been recorded within the present evaluation area, except perhaps some linear features in field 1 (see cropmark plan inset in figure 3), but there is a dense settlement site nearby at Ferry Lane Farm to the north-east, and others are indicated at Westfield Farm to the east. A number of potential archaeological features were seen in a magnetometer survey done by Geophysical Surveys of Bradford in 1994 [6]. This covered a series of trial blocks at a location corresponding to fields 7-8 of the present survey, and detected magnetic anomalies representing probable ditches and palaeochannels. The interpreted plan (figure 2 in GSB report) can be positioned to match closely with features detected in the present survey (see plan inset in figure 6).

4. Survey Procedure

The specified survey areas were investigated by means of recorded magnetometer and EM conductivity surveys, following procedures as follows.

Magnetometer survey

A magnetometer survey is often able to identify the extent and character of cut features such as ditches and pits when they are silted with an increased depth of topsoil, which usually responds more strongly than the underlying natural subsoil. Fired materials, including baked clay structures such as kilns or hearths are also likely to produce a localised enhancement of the magnetic field strength, and the survey therefore responds preferentially to the presence of ancient settlement or industrial remains. The survey is also strongly affected by ferrous and other debris of recent origin.

Readings were collected along transects 1m apart using Bartington 1m fluxgate gradiometers, and are plotted at 25cm intervals along each transect. The survey data is shown at 1:2500 as a grey scale plot in figures 12-16, and as a graphical (x-y trace) plot at 1:1500 in figures 17-27. Comparison of these alternative representations allows the detected magnetic anomalies to be examined in plan and profile respectively. (Inclusion of the x-y plot also means that the report includes a full graphical archive of the survey data, and so contains all the information required for further interpretation or re-assessment of the survey results.) An interpretation of the findings is shown superimposed on figures 17-27. This permits the interpreted outlines to be compared with the underlying data. A further interpreted plan of the findings is presented in figures 5-9, with an overall summary at a reduced scale in figure 3.

The graphical plots in figures 17-27 show the magnetometer readings after processing to the minimum extent which is required to produce an interpretable representation of the survey findings. This involves adjustment for irregularities in line spacing caused by variations in the instrument zero setting (i.e. zero mean correction to each traverse), and truncation of extreme values. Additional weak 2D low pass filtering has been applied to the grey scale plot to adjust background noise levels.

Colour coding has been used in the interpretation to distinguish different effects. The interpretation is intended to categorize most of the identifiable magnetic anomalies, but cannot reproduce the detail of the grey scale plots.

Magnetic anomalies which may be of archaeological interest are outlined in shades of red. A few strong (and perhaps recent) disturbances are outlined in grey, and cultivation effects are indicated schematically in green. Some of the more conspicuous ferrous objects (identifiable as narrow spikes in the graphical plots) are marked in light blue in figures 5-9. These are only sparsely distributed across most of the site, with no particular concentrations to suggest that parts of the site have been exposed to intensive recent activities. Irregular background magnetic anomalies which are likely to be of natural origin (including palaeochannels) are outlined in dark blue if they correspond to high conductivity EM readings. Similar features which do not relate to the EM response (or lie outside the EM survey area) are shown in a light green. Other concentrations of small background magnetic anomalies (which are likely to indicate gravel soil) are indicated selectively in light brown. Probable former field boundaries and pipes are also shown.

EM survey

The CMD Explorer contains a transmitter and multiple receiver coils capable of measuring ground conductivity (and in-phase susceptibility) at three nominal specified depths (for the vertical dipole mode). The CMD software then allows the output to be calculated for specified depth ranges, and the results as shown in figures 4 and 10-11 are based on values representing the response to approximately 5m. The conductivity values (reciprocal of resistivity), which should be greatest in areas of high water content, were used for this investigation. Readings were recorded at c. 1m intervals along approximately east-west transects walked at c. 5m separation.

Readings representing the different depth options each gave a substantially similar picture, and a plot representing the shallow (c. 1m) response is shown inset in figure 4 for comparison. It shows contrasting areas of gravel and alluvial soil, as seen also in the c. 5m depth data reproduced in the larger scale plots, but the variations are seen at lower conductivity values. This difference must reflect an increase in ground water content at increased depth.

Readings were exported from the initial CMD binary files using the CMD Data Transfer software (which creates an output file with coordinates and multiple data values at each location). The GPS locations were converted to OS coordinates using GridInQuest software, and re-combined with the data. Readings were gridded in Surfer (using the Kriging interpolation option) to 0.5m x 0.5m separation for display. A low-pass Gaussian filter, as in the magnetic grey scale plots, was used to adjust the background noise level. The readings do not appear to be subject to any conspicuous drift, and so no further detailed processing was required beyond the selection of contour levels.

The data range as displayed corresponds approximately to the mean of the data set ± 1.5 standard deviations. A summary plot of the full site is shown in figure 4, and additional plots (with superimposed contours) are reproduced at 1:4000 scale in figures 10-11.

Survey location

The magnetometer survey grid was set out and tied to the OS grid using a Trimble ProXRT GPS system (with VRS differential correction). The plans are therefore geo-referenced (to c. 0.1m accuracy), and OS co-ordinates of map locations can be read from the AutoCAD version of the plans, which can be supplied with this report.

The EM survey was located by reference to grid points defining the survey boundaries. Reading locations were tracked by GPS (with SBAS correction) as the survey was recorded.

5. Results

We discuss the magnetometer and EM findings together in relation to the various categories of findings which are identifiable in the survey.

Archaeological findings

Findings of probable archaeological relevance were detected at three main locations within the evaluation area.

Field 5

The least well defined group of findings is towards the north-west of the site in field 5, where there is a circular feature (a possible hut circle or ring ditch 10m in diameter) at A as labelled in figures 3 and 7. Other features nearby could perhaps, in an archaeological context, represent pits or settlement features. Some of the ditch-like features in field 5 are more precisely linear than would be expected for palaeochannels, but appear to be quite wide for archaeological ditches. Their response may be weakened or widened by superficial alluvium. The same is true for an additional possible circular feature at B. This apparent circle is located within an area of increased background magnetic activity. The background disturbances are represented by magnetic anomalies outlined in light brown in the interpretation, and are most concentrated around C in field 1. Activity of this kind usually indicates a near-surface gravel soil, and it corresponds here to an area of low conductivity in the EM data.

Fields 7-8

A second group of rather more positively defined archaeological features is visible in fields 7-8. These indicate distinct ring ditches (22m and 12m in diameter) at D and E, and linear and other features (perhaps indicating an area of settlement activity) extending into field 8 (F). These features correspond in part to findings noted in the 1994 survey (see plan inset in figure 6), and are also in the field closest to the Ferry Lane Farm cropmark site.

The findings around F again lie within an area of raised background magnetic activity, which suggest a gravel soil as noted in field 5, and are also cut through by linear markings representing ridge and furrow (green). Fields 7-8 correspond to the gravel island noted at the east of the evaluation area, as shown on the 1993 Trent & Peak plan inset in figure 4.

Field 17

The Trent & Peak plan shows a further area of gravel soil at the south of the evaluation area corresponding to field 17, where the present survey detected a dense group of archaeological findings (G).

The grey scale plot (figure 16) here shows rectilinear and other ditched enclosures and associated features. The site is similar to the one detected at the southern end of the Langford West survey in 2017 [3], which has since been further investigated by excavation. The site in field 17 (as in field 7, and in the 2017 survey) is cut through and perhaps eroded by ridge and furrow.

Cultivation effects of this kind are detectable on gravel soil, but do not appear to respond to the survey (or perhaps are buried or absent) on alluvial soil. Additional cultivation effects, perhaps intersected by a ditch-like feature (H), suggest the presence of a further area of gravel at the north of field 15.

Palaeochannels and geomorphology

The magnetometer survey is capable of detecting narrow or shallow silted channels, but does not respond to broad variations in soil type which may be visible in the EM data. There are, even so, clear correspondences between the two data sets. The magnetometer survey detected numerous broad irregular ditch-like features of apparently

natural origin. Magnetic features which appear to relate to the EM findings are outlined in blue, and other channel-like features in light green.

It appears from the EM plots in figures 10-11 that the contour at 32 mS/m approximately defines the most distinct channel-like features. Areas within this contour are therefore indicated by blue cross hatching in the interpreted magnetometer plans (figures 3 and 5-9) for comparison between the magnetic and EM findings. The EM results suggest the presence of particularly distinct channels at locations including I and J in field 1, K in fields 1 and 6, L in fields 6-7, and M in field 9. Channels converge at N in fields 9-10 and others are visible at O, S, R in fields 14-16.

Of these J, K, L correspond to clearly defined channels as seen in the Lidar image (inset in figure 4), and are each defined also by a sequence of channel-like magnetic anomalies. Some of those representing channel L in field 7 were seen also in the 1994 survey. (Not all the palaeochannel anomalies detected in 1994 are visible in the 2018 survey because some are located within a strip of ground now planted as cover.) Channels M, N, O also show correspondences between magnetic and EM data. The Lidar plot suggests N and O are linked sections of a semi-circular channel.

A further sequence of magnetic anomalies at P in field 1 corresponds to a Lidar channel, but lies within a wider area of high conductivity readings (suggesting an extended spread of alluvial soil around the channel). A similar effect is seen in field 6 where there are raised conductivity readings extending to the west from Horse Pool. This is not clearly reflected in the Lidar, and perhaps results from a raised water table near the pool. The magnetic anomalies within this high conductivity area in field 6 (around Q) include various broad channel-like features, but also a scatter of small magnetic anomalies. These perhaps suggest the presence here of an area of wet gravel soil, rather than pure alluvium.

There are distinct EM and magnetic anomalies at I in field 1 at the north of the survey, and R in field 16 to the south which are not clearly represented in the Lidar plot, but appear to indicate channels. The features at I may relate in part to the linear cropmarks at the north of the site as mentioned previously. A Lidar palaeochannel at S in field 15 converges with channel O. The EM plots suggest the channel at S lies within an extended spread of alluvial soil, as also noted above at P and Q.

Various channel-like magnetic anomalies are visible near to the river in the north-west of the survey (T, U), but lie outside the EM coverage. They may represent variations in the depth of silt deposition alongside the river bank. A channel-like group of EM and magnetic anomalies at V corresponds to a Lidar channel.

Areas in which concentrations of small (light brown) background magnetic anomalies suggest the presence of gravel soil all lie in areas of low conductivity response (except perhaps at Q). A cluster of such disturbances at W in field 6 relates closely to an area of low conductivity surrounded by alluvial soil.

Other findings

The magnetometer survey shows only limited findings in addition to those previously noted. They include a curving linear sequence of disturbances at X in field 1. This could typically represent debris in the fill of a former ditch, and so is likely to be an old field boundary. It is visible also in the Lidar image. There are few other clearly recent disturbances other than a scatter of ferrous and other items along the river bank (as at Y).

It was mentioned to us that prehistoric burnt mounds may be located near to watercourses, but magnetic anomalies of the kind these might create (probably broad and irregular in shape) would be difficult to distinguish from the many others seen in the vicinity of the palaeochannels.

An isolated section of pipe (blue) runs across the north-east of field 13, and another pipe follows the southern boundary of field 14.

6. Conclusions

Ground conditions appear to be satisfactory for a magnetic survey of this kind (as in previous neighbouring surveys), and the survey has identified three main areas of potential archaeological activity. The features around A, B are the least well defined because their location in part intersects an area of strong background magnetic activity likely to be caused by gravel soil, but they could represent one or more hut circles with related pits and ditches.

The findings in fields 7-8 are more distinct, although cut through and perhaps eroded by ridge and furrow. They could again represent an area of ancient settlement activity. Some of the ditches here (as well as a palaeochannel at the west of field 7) were seen previously in the 1994 survey.

The most concentrated group of archaeological findings is at the south of the evaluation area in field 17, where a dense cluster of rectilinear ditched enclosures and associated features was detected. This perhaps represents archaeological activity comparable to the Ferry Lane Farm cropmark site. In each case the groups of archaeological features are located in areas of gravel soil, as indicated by the EM or Lidar data, and are accompanied by an increase in background magnetic activity.

The EM survey has confirmed that most of the palaeochannels are located in areas of low elevation as seen in the Lidar data (as is the case for channels J, K, L, M, N, O, P, S), but has also identified channels not clearly visible in the Lidar image (I in field 1, R in field 16). The EM results also show that some of the channels (P, Q, S, part of N) are located within extended areas of alluvial soil which are not clearly apparent in the Lidar. There do not appear to be any channels visible in the Lidar which are not also detectable by EM.

Report by:

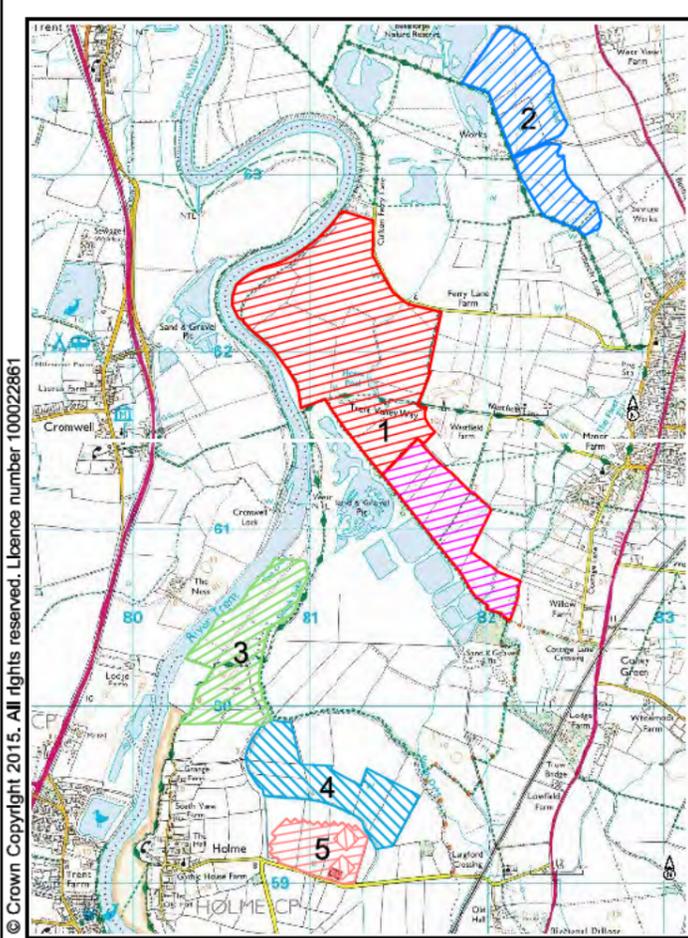
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7 September 2018

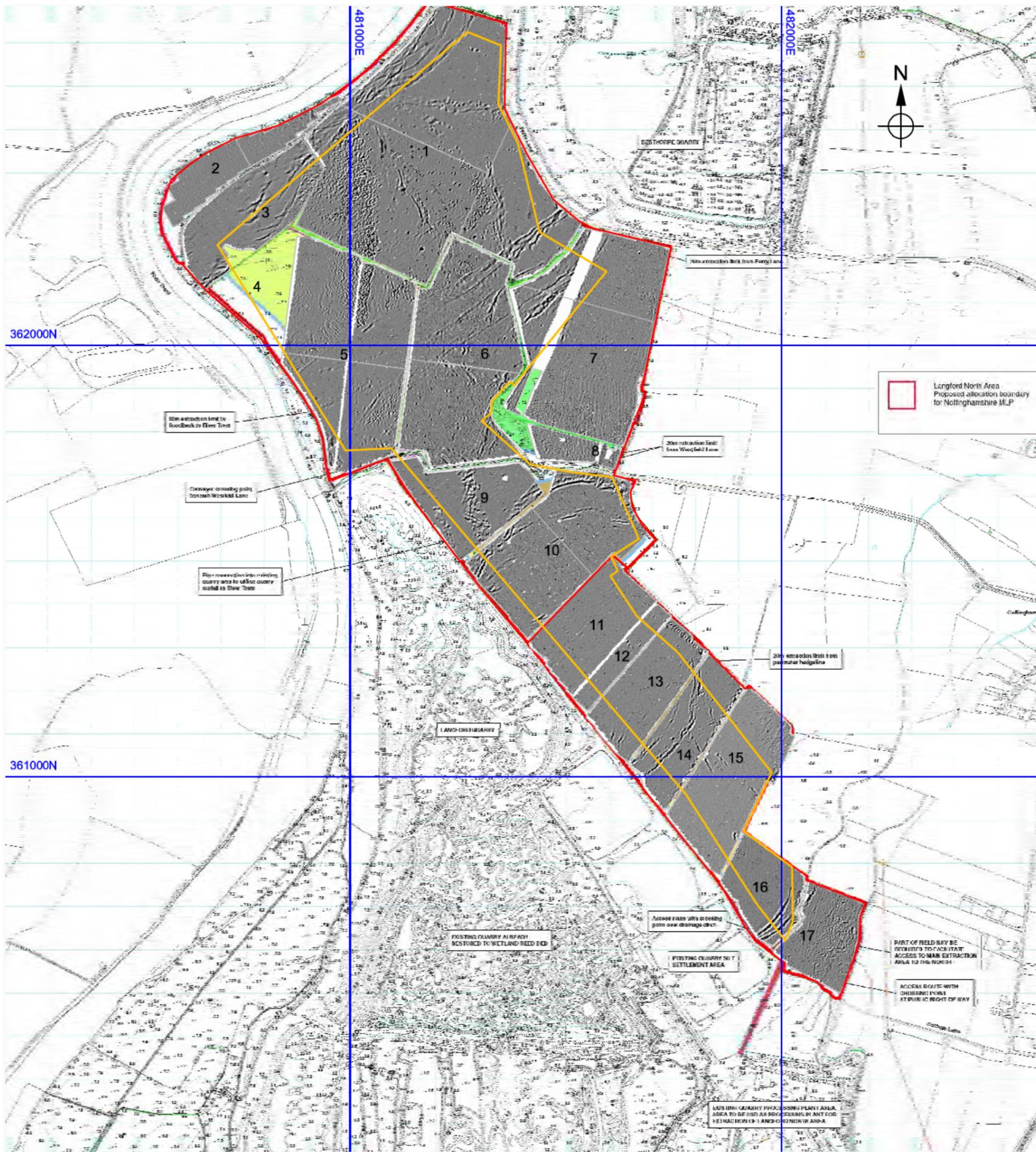
The fieldwork for this project was done by M. Berry, R. Organ, P. Heykoop, and N. Paveley. Data processing was done by P. Cottrell and A. Bartlett.

References

- [1] *Geomorphological Development of the Area South of Carlton Ferry Lane, Collingham.* Report by Trent & Peak Archaeological Trust for Ennemix Construction Materials Ltd; November 1993.
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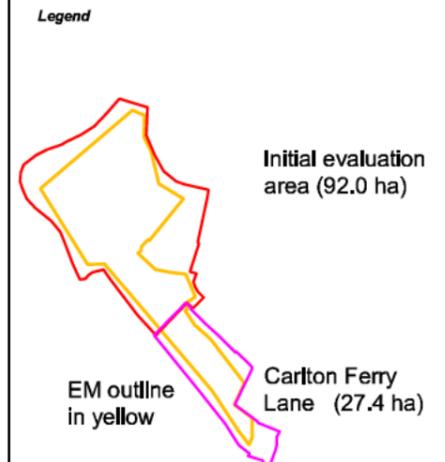


Surveys 2016-18 1:40000



Location of Extension Area

Based on Tarmac Drawing No. L20N6A17.PDF. OS Digital Data © Crown Copyright. Licence number 100019980.



- Surveys 2016-2018:
- 1 Langford North (2017-18) with Carlton Ferry Lane (2018)
 - 2 Besthorpe (2017)
 - 3 Langford West (2017)
 - 4 Langford South (2017)
 - 5 Langford Roman Camp (2016)



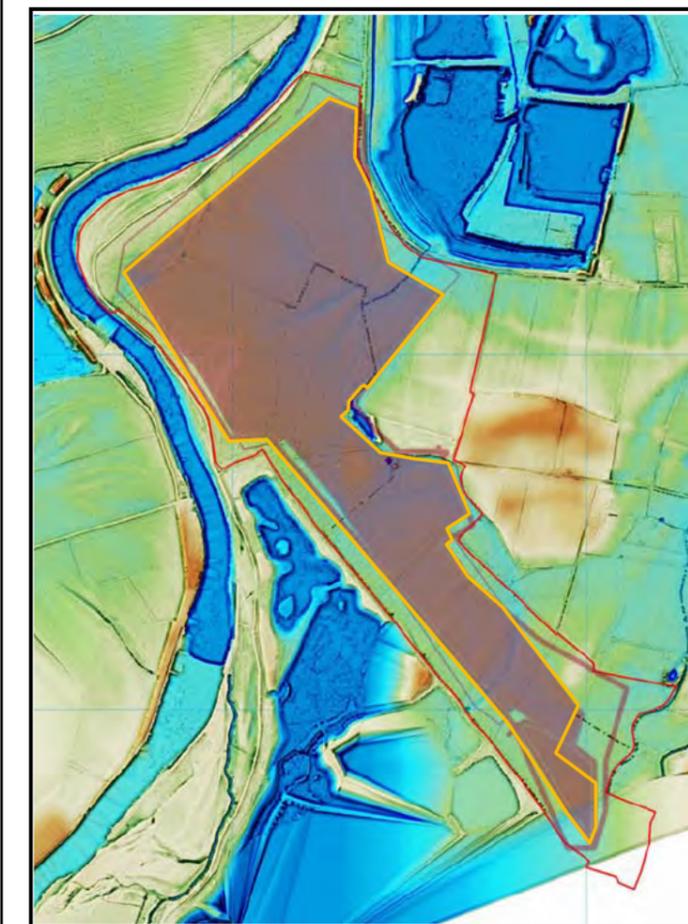
Surveyed by Bartlett Clark Consultancy (01865 200864)

for
Archaeologica Ltd
7 Fosters Lane
Bradwell
Milton Keynes MK13 9HD
on behalf of



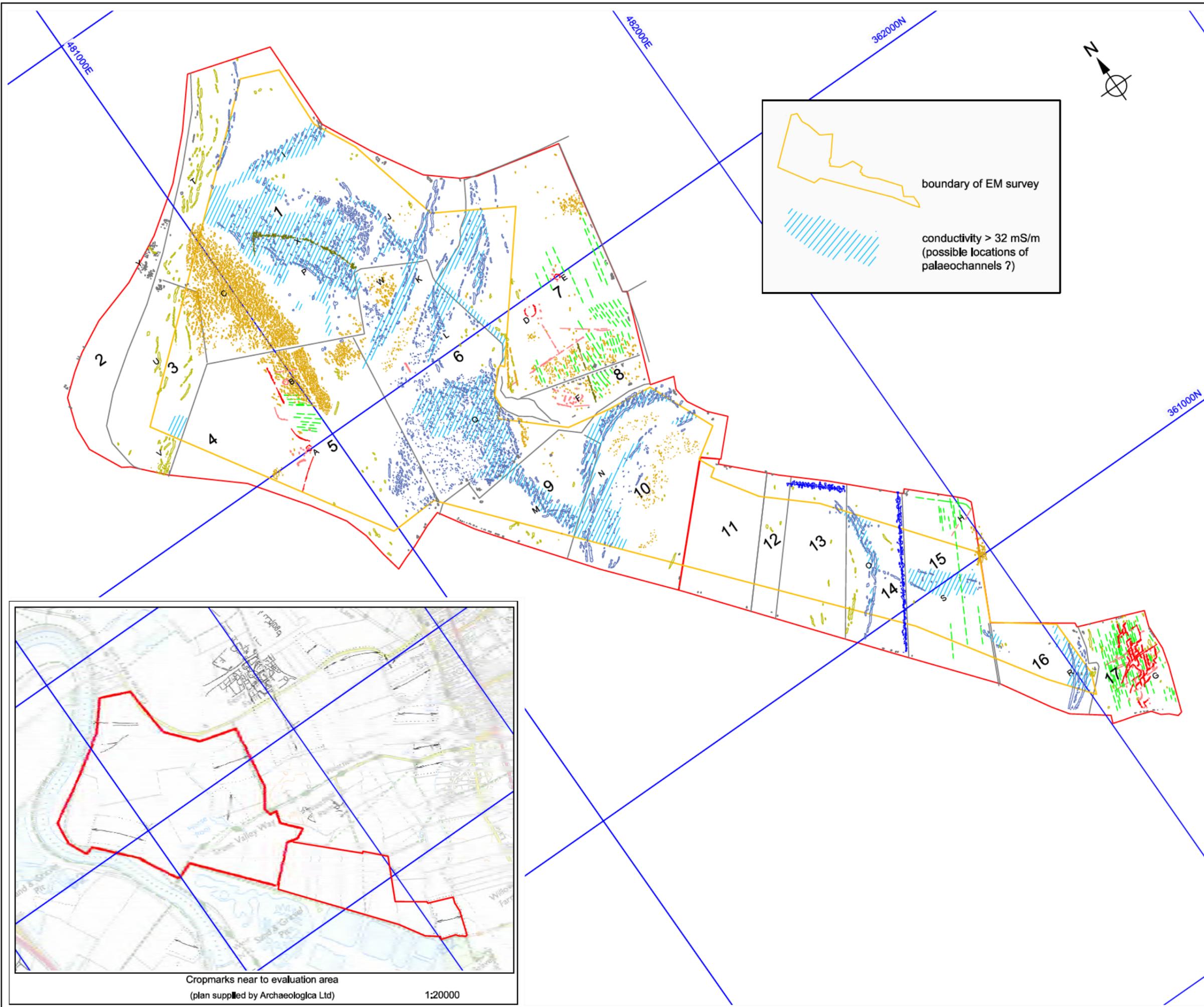
Project
**Langford Quarry
Northern Extension Area**
**Archaeological Geophysical
Surveys 2017-18**

Drawing title
Figure 1
**Location of magnetometer
and EM surveys**



Proposed EM survey location (grey shading) with survey outline (yellow) 1:20000

1 - 17 field numbers



boundary of EM survey

conductivity > 32 mS/m
(possible locations of palaeochannels ?)

- Legend**
- magnetic anomalies (archaeological ?)
 - magnetic anomalies (possibly archaeological ?)
 - magnetic anomalies corresponding to areas of high EM conductivity
 - other broad/irregular magnetic anomalies (naturally silted hollows or channels ?)
 - concentrations of background magnetic anomalies in low conductivity areas (near-surface gravel ?)
 - strong (recent ?) magnetic disturbances
 - former field boundary ?
 - cultivation ?
 - pipe

1 - 17 field numbers

0 250m
Scale 1:7500 @ A3

Surveyed by Bartlett Clark Consultancy
(01865 200864)

for
Archaeologica Ltd
7 Fosters Lane
Bradwell
Milton Keynes MK13 9HD
on behalf of

TARMAC
A CRH COMPANY

Project

Langford Quarry
Northern Extension Area

Archaeological Geophysical
Surveys 2017-18

Drawing title

Figure 3

Magnetometer survey
(summary of findings)

Besthorpe East

Sustainability Appraisal Objectives	Effect – Operational Period	Effect – Long Term	Commentary (NCC)	Mitigation (NCC)	Tarmac Comments	Revised Scoring Effect - Operational period	Revised Scoring Effect – Long Term
1. Ensure that adequate provision is made to meet local and national mineral demand.	+2	0	The size of the estimated reserves of this site would contribute positively to meeting national and local demand for sand and gravel.	Not applicable.	Paragraph 203 of the NPPF advocates it is 'essential' that there is sufficient supply of minerals. The MPA are advocating policies where extensions to existing operations are 'preferred' on account of their sustainability merits. It is therefore considered that an extension to Besthorpe Quarry has been underscored for the positive contribution it can make to the continuation of mineral supply.	+3	0
2. Protect and enhance biodiversity at all levels and safeguard features of geological interest.	-1	+3	<p>The site is immediately adjacent to Mons Pool LWS and to Northcroft Lane Meadow LWS. It is also in close proximity to the Black Pool and Langford Marsh LWS, and to Besthorpe Meadows SSSI. There is therefore the potential for direct and indirect impacts to these sites, including through noise, dust, NOx and changes to hydrology and hydrogeology.</p> <p>It is stated that restoration will be to predominantly water-based nature conservation in line with the published RSPB "Bigger and Better" vision for the restoration and after use of sand and gravel workings in the Trent Valley north of Newark. The restoration scheme will enhance the existing wetland nature reserve areas created through quarry reclamation schemes at Besthorpe Quarry over the previous 30 years.</p> <p>Such restoration would deliver significant biodiversity benefits and would contribute to a larger landscape scale delivery of wetland habitats as per the "Bigger and Better" concept plan document.</p>	Ecological surveys and hydrological reports. Buffer zones. Appropriate restoration scheme to enhance biodiversity.	Scoping Opinion issued by Notts CC on 28th March 2018 confirmed there are no overriding ecological constraints and that "potential ecological benefits may be obtained by connecting the restored habitat to The Fleet watercourse."	-1	+3

<p>3. Promote sustainable patterns of movement and the use of more sustainable modes of transport.</p>	<p>+1</p>	<p>0</p>	<p>As this is an extension, the existing access would be utilised, which is well-related to the main highway network (A1133).</p> <p>The existing wharf facility to load river barges is mothballed but is available for use if the economics of supply by barge becomes viable in future.</p>	<p>Not applicable.</p>	<p>Use of an existing and well established access means that the impact from traffic is already assessed. Given the extension will increase the life of the site there will be a potential ongoing impact upon the local highway network. However, hgv vehicle routing is already successfully controlled by S106 Agreement, to mitigate impact on local settlements. In addition if general economic conditions improve and the wharf facility is reopened this would generate the sustainable transport of aggregate during the life of operations.</p> <p>The proposed quarry extension area also provides the opportunity to create a linking section of the Trent Vale Sustrans route around the eastern boundary of the Besthorpe Nature Reserve. The delivery of the Sustrans route has wide community support and through allocation of the Besthorpe Quarry East extension in the Plan the route could be delivered.</p>	<p>+2</p>	<p>+1</p>
<p>4. Protect the quality of the historic environment, heritage assets and their settings above and below ground.</p>	<p>-2</p>	<p>1</p>	<p>The setting of Collingham Conservation Area and some listed buildings in the village could be adversely affected. The site has high archaeological potential.</p> <p>The long term impact on the settings of the conservation area and listed buildings could be positive or negative depending on the nature of restoration.</p>	<p>Buffer zones and screening. Archaeological surveys to determine the nature and significance of any remains, then adequate provision to be made for preservation, excavation or recording. Metal detector on conveyor belt to seek metal objects of archaeological interest.</p>	<p>An archaeological trenching programme has been carried out over the proposed mineral area in August / September 2018 in accordance with a Written Scheme of Investigation approved by Notts CC. The summary of the findings from the trenching is that the site has generally low potential for archaeological remains. The summary report from Trent & Peak is submitted with Tarmac's representations (enclosed).</p> <p>The closest part of the extension area is circa 500 metres from the NE edge of Collingham village, and there is no significant visual</p>	<p>-1</p>	<p>0</p>

					<p>connectivity with the local Conservation Area as the development is well screened from sensitive receptors.</p> <p>It is therefore considered that the assessment has been over scored.</p>		
5. Protect and enhance the quality and character of our townscape and landscape.	-2	-2	<p>The landscape assessment resulted in a combined landscape of 58/100 for the operational period, so the impact is considered to be negative.</p> <p>The landscape assessment for post-restoration resulted in combined landscape score of 62/100 so the impact is considered to remain negative.</p>	<p>During the operational phase there should be planting adjacent to Besthorpe Nature Reserve and retention of a buffer >15m along the Fleet watercourse.</p>	<p>The restoration scheme will deliver an extension of the established Besthorpe Nature Reserve, created through previously sand and gravel working at the site. The Reserve is managed by the Nottinghamshire Wildlife Trust. It is therefore considered that the assessment has been over scored for the long term.</p>	-2	0
6. Minimise impact and risk of flooding	-3		<p>The site is located within Flood Zone 3 (high flood risk area) and the functional flood plain. Sand and gravel workings are considered to be water-compatible development which is appropriate in this zone provided that there is no net loss of floodplain storage, water flows are not impeded, and flood risk is not increased elsewhere. There is insufficient information at this stage on which to determine the impact of operations and as it is a high-risk zone, the effect has to be considered as very negative. Impact in the long term could be positive or negative depending on the nature of restoration.</p>	<p>Meeting the requirements of the Environment Agency, Flood Risk Assessment (FRA) including consideration of flood flow and storage. Implementation of SuDs.</p>	<p>This takes an unnecessarily negative stance on the potential for impact. As advised mineral operations are water compatible and flood resilience and compensation would be incorporated as part of any restoration proposals as per the existing approved restoration scheme.</p> <p>The extension area is not adjacent to the main River Trent and there is opportunity to deliver flood water storage from the adjoining Fleet watercourse.</p> <p>The Environment Agency response dated 7th March 2018 to the Scoping Report stated that ".the Environment Agency welcomes the development of wetland sites and these should be designed in accordance with the surrounding areas.."</p>	-2	0

7. Minimise any possible impacts on, and increase adaptability to, climate change.	?		During the operational phase, the effect would be dependent on the details of operation e.g. whether the most energy efficient plant and machinery were used. Thereafter, in the long term, the effect could be positive or negative in terms of increasing the resilience of flora and fauna to climate change depending on the details of restoration.	Implement restoration which provides appropriate habitats to help increase the resilience of flora and fauna.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently.	0	0
8. Protect high quality agricultural land and soil.	-1	-1	Predominantly Grade 3b agricultural (86%), which is not high quality, but with some Grade 3a (12%) which is best and most versatile.	Restoration of an appropriate proportion of the site to high quality agricultural land if that is possible.	Good soils management strategies would ensure that the best and most versatile agricultural soils are retained and reused in restoration, although the site will be water based restoration.	-1	-1
9. Promote more efficient use of land and resources.	+1	?	Most efficient use of land would result from an extension, which could utilise the existing site's infrastructure.	Not applicable.	The continuity of production at Besthorpe Quarry in the extension area would ensure that mineral resource is not needlessly sterilised. This would promote the long term efficient use of land and resources. The mineral resource in the extension area is up to circa 12 metres thick and there is consequently a high yield per acre compared to many other sand and gravel resources.	+3	0
10. Promote energy efficiency and maximise renewable energy opportunities from new or existing development.	?	?	Effect would be dependent on the details of operation, such as the use of energy efficient plant and machinery and renewable energy sources for on-site power.	Not applicable.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently	0	0
11. Protect and improve local air quality.	-2	0	Operations would create dust. The mineral would be exported by HGV with an estimated 72 two way movements (36 HGV arrivals and 36 HGV departures) per average working day.	Environmental protection measures to reduce dust.	The current quarry operations do not give rise to dust nuisance or complaints. The extension area would utilise existing dust mitigation practices and therefore even during the operation phase the impacts are not likely to be significant.	-1	0

12. Protect and improve water quality and promote efficient use of water.	-1	0	Potential de-watering and discharge into watercourses.	Hydrological reports. On-site protection measures to avoid contamination of surface waters and groundwater. Implementation of SuDs. Meeting the requirements of the Environment Agency and Internal Drainage Board (IDB).	Water management would continue as for the existing quarry, with water discharge in accordance with formal Discharge Permits.	-1	0
13. Support wider economic development and promote local job opportunities.	+2	0	This site has the potential to produce a large quantity of aggregate which is important in supporting the wider economy particularly through meeting the demands of the construction industry. There is also the potential for creation of some local job opportunities.	Not applicable	NPPF paragraph 205 advocates 'great weight' to be given to the benefits of mineral extraction including to the economy. Whilst local jobs will be preserved, with potential for future creation, the longer term effects of mineral extraction in providing essential housing and infrastructure requirements should be recognised.	+3	0
14. Protect and improve human health and quality of life.	-2	+2	There are settlements in close proximity to the site so during the operational phase, there could be a negative effect resulting from noise, dust and traffic. In terms of visual amenity, the main receptors would be users of rights of way (RoWs) and visitors to Besthorpe Nature Reserve. A few isolated farms may have distant views in the winter months. There are RoWs within the site and partly adjoining the site boundaries. Disruption of these RoWs would add to the negative impact. There is potential for long-term benefits through restoration allowing for public access and linking into the RSPB's 'Bigger and Better vision' for landscape-scale delivery of wetland habitats.	Environmental protection measures to reduce noise and dust. Transport Assessment. Protection/re-routing of RoWs. Public access opportunities as part of restoration scheme for nature conservation.	The development of the Besthorpe Quarry East scheme could assist in delivering an important link for the Trent Vale Sustrans route. The route could be established as part of the early stages of site development.	-1	+3
Total	-8	+2				+1	+6

Scale	Likely effect on the SA Objective
+3	The proposal is likely to have a very positive impact
+2	The proposal is likely to have a positive impact
+1	The proposal is likely to have a slightly positive impact
0	No significant effect / no clear link
?	Uncertain or insufficient information on which to determine impact
!	The proposal could have a positive or a negative impact depending on how it is implemented

-1	The proposal is likely to have a slightly negative impact
-2	The proposal is likely to have a negative impact
-3	The proposal is likely to have a very negative impact

BESTHORPE QUARRY, EASTERN EXTENSION
COLLINGHAM, NOTTINGHAMSHIRE
Archaeological Trial Trench Evaluation
Summary of Preliminary Results
2018

Prepared for: Tarmac Trading

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1 Introduction

- 1.1 Trent & Peak Archaeology was commissioned to carry out an archaeological trial trench evaluation on land forming the proposed eastern extension of Besthorpe Quarry (the site).
- 1.2 The archaeological potential of the proposed quarry extension site was initially quantified by a desk based assessment (hereafter DBA) (Dicken 2017), which was supported by a geophysical survey (Bartlett-Clark Consultancy 2017).
- 1.3 Pre-planning application advice in the form of an opinion scoping consultation (ref: SC/3824) was initiated by the client, which would help to inform the decision to investigate potential archaeological impacts on land at the proposed mineral extraction site, situated east and north-east of the current quarry boundary.
- 1.4 Due to the presence of significant archaeological features and deposits in fields adjacent to the current proposed extension (Thompson and Nevall 2018), the Senior Archaeological Practitioner for Nottinghamshire County Council, Ursilla Spence, has advised that a program of archaeological trial trenching be carried out in advance of quarrying. This is in reflection of prior planning conditions attached to the development which also necessitated a strategy of archaeological mitigation.
- 1.5 An earlier desk-based assessment (hereafter DBA) by Trent and Peak Archaeology (Dicken 2017) was unable to fully quantify the potential for buried archaeological remains within the proposed development area, although recent reports indicate a moderate to high potential for sub-surface buried archaeological remains relating to Mesolithic-Romano-British land use (Thompson and Nevall 2018).
- 1.6 The Trent Palaeochannel Mapping Project (Malone and Stein 2017), utilising Lidar data of the local area (Dicken 2017; fig 4), suggests that a number of probable former streams or palaeochannels cross the site in a number of areas (Fig 1, blue shaded areas). The Fleet at this time appears to separate and re-join twice across the fields, which may indicate earlier water management.
- 1.7 Under the guidance of the Senior Archaeological Practitioner for Nottinghamshire County Council, Ursilla Spence, a strategy for archaeological mitigation was prepared which entailed the placement of 50 trenches across a 37.9Ha area. These targeted possible archaeological deposits identified by the geophysical survey (Bartlett-Clark Consultancy 2017), and aimed to better elucidate the sub-surface topography and potential for buried archaeological features which may be masked by deep alluvial deposits (Spence Pers Comms).

2 Results

2.1 A total of 50 trenches were excavated across the site.

2.2 Trench results from the evaluation can be categorised into 4 groups:

- Archaeological features present (1-2 features)
- Deep palaeochannel deposits encountered
- Deep alluvium encountered
- No archaeology

Archaeological Features Present (1-2 features) Fig 1 Green Trenches (7 trenches)

2.3 Low levels of archaeological activity were detected across the site. Two sparse concentrations of features were focused on trenches 10 and 13 in the northern part of the site and trenches 41-44 and 46 in the south. The archaeology present comprised a number of very shallow linear gullies and shallow irregular pits. All but one of these features remains undated. A single possible pit or tree bole in trench produced a broadly prehistoric worked flint flake

Deep Palaeochannel Deposits Fig 1 Red trenches (6 trenches)

2.4 Palaeochannel deposits ranging in depth from 1.2m BGL to beyond 2m BGL were encountered in four of the five trenches which targeted the north south channel detected by Lidar (Trenches 1, 3, 18 and 23). Chanel deposits were also recorded in trenches 34 and 47. Although no archaeological features were present in these trenches a single wooden stake which may have been worked was retrieved from organic rich deposits in Trench 23. There is the possibility that deep deposits, which could not be fully excavated within the confines of a trench, could be masking buried archaeological features.

Deep Alluvial Deposits Fig 1 Orange Trenches (10 trenches)

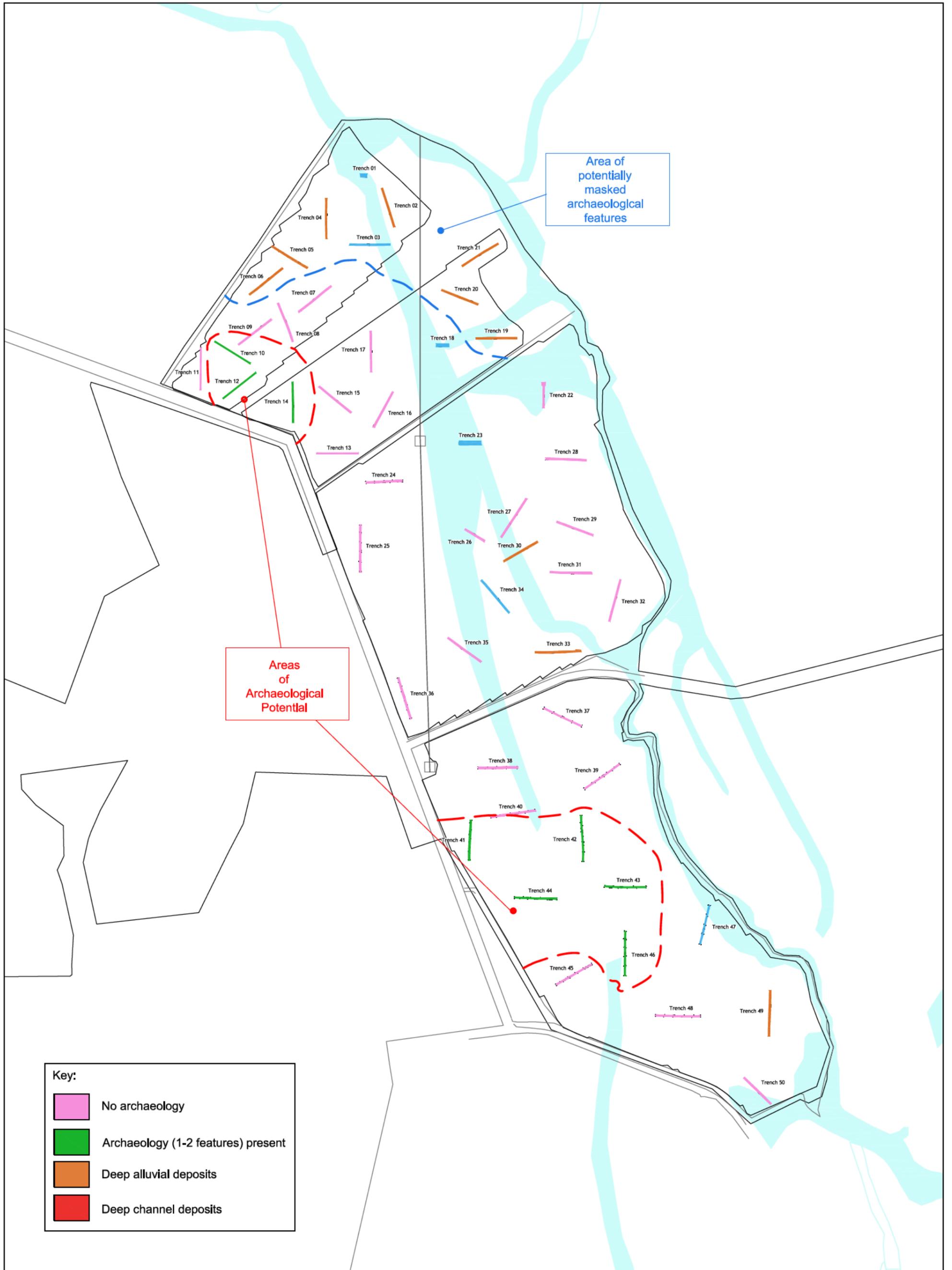
2.5 Deep alluvial deposits were recorded in 10 trenches concentrated in the northern part of the site. These are likely to represent sporadic over bank flooding of the Fleet or one of its former course. Where these deposits were deeper than 1.2m BGL machine dug slots were excavated down to the natural sands and gravels at intervals along the trench. It is possible that these deposits could be masking buried archaeological features

No Archaeology Fig 1 Pink Trenches (27 trenches)

2.6 Natural sands and gravels were exposed along the entirety of the these trenches and no archaeological features were present. Other than a very abraded Roma-British flagon handle from the topsoil in trench 34 and the aforementioned flint flake no finds of archaeological interest were retrieved from the evaluation.

3 Conclusions

- 3.1 The evaluation has detected a low level of archaeological activity focused on two areas in the north and south of the site (see Areas of Archaeological Potential Fig 1). These comprise shallow irregular pits and linear gullies. Other than a flint flake recovered from one of the pits no finds were retrieved from any of the features.
- 3.2 Deep alluvial deposits were encountered mostly on the northern part of the site (see Area of Potentially Masked Archaeological Features Fig 1). The depth of these deposits meant they could not be fully removed within the confines of the trench and so there remains the possibility that they may mask underlying features. However given the paucity of features and finds from the site as a whole any features present are likely to be similarly sparse.
- 3.3 The evaluation confirmed the presence of palaeochannels crossing the site. These were found to contain waterlogged organic deposits from which a possible worked wooden stake was retrieved. The channels remain undated and full profiles were not achievable within the confines of the trenches.



Areas of Archaeological Potential

Area of potentially masked archaeological features

Key:

- No archaeology
- Archaeology (1-2 features) present
- Deep alluvial deposits
- Deep channel deposits

Burrige Farm							
Sustainability Appraisal Objectives	Effect – Operational Period	Effect – Long Term	Commentary (NCC)	Mitigation (NCC)	Tarmac Comments	Revised Scoring Effect - Operational period	Revised Scoring Effect – Long Term
1. Ensure that adequate provision is made to meet local and national mineral demand.	+2	0	The size of the estimated reserves of this site would contribute positively to meeting national and local demand for sand and gravel.	Not applicable.		+2	0
2. Protect and enhance biodiversity at all levels and safeguard features of geological interest.	-1	+3	The site is immediately adjacent to The Fleet, South Muskham LWS, close to Trent West Bank LWS, and is immediately across the River Trent from Winthorpe Lake LWS. There is therefore the potential for direct and indirect impacts to these sites, including from noise, dust, NOx and changes to hydrology and hydrogeology. It is stated that restoration would be to nature conservation afteruses, comprising wet grassland and open water with marginal planting and reedbed. Such restoration could lead to significant biodiversity benefits, depending on the scale of habitat created.	Ecological surveys and hydrological reports. Buffer zones. Appropriate restoration scheme to enhance biodiversity.		-1	+3
3. Promote sustainable patterns of movement and the use of more sustainable modes of transport.	+2	0	The extracted mineral would be transported by barge along the River Trent for processing at Cromwell Quarry, which has an existing wharf facility, approximately 4.5 km to the north. Access from Cromwell is well-related to the main highway network (A1).	Not applicable.	Whilst the barging of sand and gravel is a sustainable mode of transport, there are some operational constraints / uncertainties regarding the capacity of the lock at Cromwell Weir for the passage of river barges. Production may be more constrained compared to traditional land based mineral extraction.	+2	0
4. Protect the quality of the historic environment, heritage assets and their settings above and below ground.	-2	1	The south-eastern corner of the site adjoins the listed Winthorpe Bridge, the setting of which could be adversely affected, along with the setting of Winthorpe Conservation Area and the listed Winthorpe Hall. A Scheduled Monument (Iron Age settlement) lies to the NW, with the north-west corner of the site adjoining it. Remains extend on air photographic mapping up to The Fleet which forms the western edge of the site. There is potential for an adverse impact on the setting. The area should be regarded as of high potential for buried remains. The	Buffer zones and screening. Archaeological surveys to determine the extent of any impact on the scheduled monument and whether mitigation is feasible. Archaeological surveys to determine the nature and significance of non-designated remains, then adequate provision		-2	1

			<p>site also has high archaeological potential in terms of non-designated features.</p> <p>In the long term the impact on the settings of these heritage assets could be positive or negative, depending on the nature of restoration.</p>	<p>to be made for preservation, excavation or recording.</p> <p>Metal detector on conveyor belt to seek metal objects of archaeological interest. Appropriate restoration proposals.</p>			
5. Protect and enhance the quality and character of our townscape and landscape.	-2	-1	<p>The landscape assessment resulted in a combined landscape score of 67/100 for the operational period so the impact is considered to be negative. The landscape assessment for post-restoration resulted in a combined landscape score of 48/100 so the impact is considered to be slightly negative.</p>	<p>The operational phase should incorporate screening from the river and Winthorpe Lakes and a buffer to protect The Fleet LWS.</p> <p>Restoration should strengthen riparian planting, incorporate grassland, particularly adjacent to the River Trent corridor.</p> <p>Open water mosaic could add value to existing Winthorpe lakes and mineral working to south.</p>		-2	-1
6. Minimise impact and risk of flooding	-3	1	<p>The site is located within Flood Zone 3 (high flood risk area) and the functional flood plain and is largely bounded by the River Trent. Sand and gravel workings are considered to be water-compatible development which is appropriate in this zone provided that there is no net loss of floodplain storage, water flows are not impeded and flood risk is not increased elsewhere.</p> <p>There is insufficient information at this stage on which to determine the impact of operations and as it is a high risk zone the effect has to be considered as very negative.</p>	<p>Meeting the requirements of the Environment Agency and Internal Drainage Board.</p> <p>Flood Risk Assessment (FRA) including consideration of flood flow and storage.</p> <p>Implementation of SuDs</p>	<p>This takes an unnecessarily negative stance on the potential for impact. As advised mineral operations are water compatible and flood resilience and compensation would be incorporated as part of any restoration proposals. Operational working would have to consider the potential for flood impact. Restoration offers opportunities for flood resilience measures to be included as part of restoration.</p>	-1	+1
7. Minimise any possible impacts on, and increase adaptability to, climate change.	?	1	<p>During the operational phase the effect would be dependent on the details of operation, e.g. whether the most energy efficient plant and machinery were used. Thereafter, in the long term, the effect could be positive or negative in terms of increasing the resilience of flora and fauna to climate change depending on the details of restoration.</p>	<p>Implement restoration which provides appropriate habitats to help to increase the resilience of flora and fauna.</p>	<p>Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently.</p>	0	0
8. Protect high quality agricultural land and soil.	-2	-2	<p>The site is a mix of Grade 3a (best and most versatile) and Grade 3b (not high quality) agricultural land. Restoration would be biodiversity-led.</p>	<p>Restoration to high quality agricultural land if that is possible.</p>	<p>The Burridge Farm site is proposed to be restored to nature conservation afteruses comprising wet grassland and open water with marginal planting and reed bed and retention of vegetation along outer site boundaries. There</p>	-2	-2

					are no realistic opportunities for import of inert materials to restore the land to agricultural use.		
9. Promote more efficient use of land and resources.	0	?	No significant effect during the operational period.	Not applicable.		0	0
10. Promote energy efficiency and maximise renewable energy opportunities from new or existing development.	?	?	Effect would be dependent on the details of operation, such as the use of energy efficient plant and machinery and renewable energy sources for on-site power.	Not applicable.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently	0	0
11. Protect and improve local air quality.	-2	0	Operations would create dust. The mineral would be exported by HGV with an estimated 54 two way movements (27 HGV arrivals and 27 HGV departures) per average working day.	Environmental protection measures to reduce dust.	Material would be transported by barge to processing facilities at the former Cromwell Quarry plant site.	-1	0
12. Protect and improve water quality and promote efficient use of water.	-1	0	Potential de-watering and discharge into watercourses.	Hydrological reports. On-site protection measures to avoid contamination of surface waters and groundwater. Implementation of SuDs. Meeting the requirements of the Environment Agency and Internal Drainage Board (IDB).		-1	0
13. Support wider economic development and promote local job opportunities.	+2	0	This site has the potential to produce a large quantity of aggregate which is important in supporting the wider economy particularly through meeting the demands of the construction industry. There is also the potential for creation of some local job opportunities.	Not applicable.	NPPF paragraph 205 advocates 'great weight' to be given to the benefits of mineral extraction including to the economy. Whilst local jobs will be created the longer term effects of mineral extraction in providing essential housing and infrastructure requirements should be recognised.	+3	0

14. Protect and improve human health and quality of life.	-1	+2	<p>There are settlements in close proximity to the site so during the operational phase there could be a negative effect resulting from noise, dust and traffic. However there would not be any detrimental impact on residents in terms of visual amenity. No RoWs are affected.</p> <p>There is potential for long term benefits, through restoration allowing for public access and linking into the RSPB's 'Bigger and Better' vision for landscape scale delivery of wetland habitats.</p>	<p>Environmental protection measures to reduce noise and dust.</p> <p>Transport Assessment.</p>		-1	+2
Total	-8	+2				-4	+3

Scale	Likely effect on the SA Objective
+3	The proposal is likely to have a very positive impact
+2	The proposal is likely to have a positive impact
+1	The proposal is likely to have a slightly positive impact
0	No significant effect / no clear link
?	Uncertain or insufficient information on which to determine impact
1	The proposal could have a positive or a negative impact depending on how it is implemented
-1	The proposal is likely to have a slightly negative impact
-2	The proposal is likely to have a negative impact
-3	The proposal is likely to have a very negative impact

Great North Road North

Sustainability Appraisal Objectives	Effect – Operational Period	Effect – Long Term	Commentary (NCC)	Mitigation (NCC)	Tarmac Comments	Revised Scoring Effect - Operational period	Revised Scoring Effect – Long Term
1. Ensure that adequate provision is made to meet local and national mineral demand.	+2	0	The size of the estimated reserves of this site would contribute positively to meeting national and local demand for sand and gravel.	Not applicable.	Given the locational strategy this site assists in local and wider needs and will secure sand and gravel to the local market as well as being well positioned to serve Nottingham and NE Leicestershire markets (due to its proximity to the A46) following projected exhaustion of reserves and closure of sand and gravel operations in Leicestershire, particularly at Brooksby Quarry, which currently supplies the Barnstone Cement works in Nottinghamshire.	+3	0
2. Protect and enhance biodiversity at all levels and safeguard features of geological interest.	-1	+2	<p>The site adjoins Kelham Trent and Island LWS, and Kelham Pool LWS, and is close to a cluster of several other LWSs. There is therefore the potential for direct and indirect impacts to these sites, including through noise, dust, NOx and changes to hydrology and hydrogeology.</p> <p>The proposed restoration is stated as being to agriculture, although it is stated that there is a 'significant opportunity' to create enhanced grassland habitats in the corridor adjoining the Trent. The scheme may therefore deliver at least modest biodiversity benefits. There is potential to create an extensive area of wet grassland (floodplain grazing marsh), which would deliver significant biodiversity benefits if done at scale, and would allow continued use as farmland through grazing</p>	<p>Ecological surveys and hydrological reports.</p> <p>Buffer zones.</p> <p>Appropriate restoration scheme to enhance biodiversity.</p>		-1	+2
3. Promote sustainable patterns of movement and the use of more	1	0	The site is well related to the main highway network, with direct access off the A616, however the A616 Great North Road junction with the A46 is heavily congested at peak times and the A46 around Newark is generally under a capacity strain, therefore lorry routing requires careful consideration.	Imposition of a lorry routing agreement or a similar management control to ensure that HGV traffic avoids inappropriate routes.		1	0

sustainable modes of transport.							
4. Protect the quality of the historic environment, heritage assets and their settings above and below ground.	-2	I	<p>This site is very close to the listed Kelham Bridge and within the setting of the listed Kelham Hall and Kelham Conservation Area. It is immediately adjacent to the listed Smeaton's Arches. It is highly likely that there will be adverse impacts on the settings of these built heritage assets.</p> <p>There are two Civil War era scheduled monuments within close proximity to the site and the settings of these (along with the non-designated heritage asset "Edinburgh Fort") may be adversely affected. The site also has medium to high potential for non designated archaeology.</p> <p>In the long term the impact on the settings of heritage assets could be positive or negative, depending on the nature of restoration.</p>	<p>Buffer zones and screening.</p> <p>Archaeological surveys to determine the nature and significance of non-designated remains, then adequate provision to be made for preservation, excavation or recording.</p> <p>Metal detector on conveyor belt to seek metal objects of archaeological interest.</p> <p>Appropriate restoration proposals.</p>		-2	I
5. Protect and enhance the quality and character of our townscape and landscape.	-3	-2	<p>The landscape assessment resulted in a combined landscape score of 77/100 for the operational period so the impact is considered to be very negative.</p> <p>The landscape assessment for post-restoration resulted in a combined landscape score of 64/100 so the impact is considered to be negative.</p>	<p>During the operational phase there would be a screening opportunity along the river and road corridor, particularly from Kelham and a buffer /stand off to protect the Civil War earthwork and river corridor should be provided.</p> <p>Restoration should include riparian and road side planting, hedgerow restoration and riverside pasture.</p>	<p>The working of the site would be long term as the reserves would extend beyond the Plan period. The development of the site would be progressive in terms of extraction and restoration. The site adjoins areas of large scale intensive industrial use (sugar beet factory immediately east of Great North Road) and therefore landscape impact should be seen in that context.</p> <p>Restoration is largely to agricultural use, with shallow water features along the river corridor creating visual interest. The long term landscape impact is therefore considered to be neutral at worst and therefore overstated.</p>	-2	0
6. Minimise impact and risk of flooding	-3	I	<p>The site is located within Flood Zone 3 (high flood risk area) and the functional flood plain. Sand and gravel workings are considered to be water compatible development which is appropriate in this zone provided that there is no net loss of floodplain storage, water flows are not impeded and flood risk is not increased elsewhere.</p>	<p>Meeting the requirements of the Environment Agency and Internal Drainage Board.</p> <p>Flood Risk Assessment (FRA) including consideration of flood flow and storage.</p> <p>Implementation of SuDs.</p>	<p>This takes an unnecessarily negative stance on the potential for impact. As advised mineral operations are water compatible and flood resilience and compensation would be</p>	-1	+1

			<p>There is insufficient information at this stage on which to determine the impact of operations and as it is a high risk zone the effect has to be considered as very negative.</p> <p>The Environment Agency has raised particular concern in relation to this site and flood risk, due to its proximity to the village of Kelham. This area is known for flooding and is the first area to be affected when the River Trent overtops.</p> <p>Impact in the long-term could be positive or negative depending on the nature of restoration.</p>		<p>incorporated as part of any restoration proposals.</p> <p>Operational working would have to consider the potential for flood impact. Restoration offers opportunities for flood resilience measures to be included as part of restoration.</p>		
7. Minimise any possible impacts on, and increase adaptability to, climate change.	?	1	<p>During the operational phase the effect would be dependent on the details of operation, e.g. whether the most energy efficient plant and machinery were used. Thereafter, in the long term, the effect could be positive or negative in terms of increasing the resilience of flora and fauna to climate change depending on the details of restoration.</p>	<p>Implement restoration which provides appropriate habitats to help to increase the resilience of flora and fauna.</p>	<p>Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently.</p>	0	0
8. Protect high quality agricultural land and soil.	-2	?	<p>The site is predominantly Grade 2 and Grade 3a, which is best and most versatile agricultural land, with the remainder being Grade 3b which is not high quality.</p> <p>Restoration is proposed to be to agriculture, but it is not clear whether this would match the existing quality.</p>	<p>Restoration to high quality agricultural land if that is possible.</p>	<p>Good soils management strategies would ensure that the best and most versatile agricultural soils are retained and reused in restoration. The proposals involve the importation of imported inert materials to maximise restoration to agriculture.</p>	-1	-1
9. Promote more efficient use of land and resources.	0	?	<p>No significant effect during the operational period.</p>	<p>Not applicable.</p>		0	0
10. Promote energy efficiency and maximise renewable energy opportunities from new or existing development.	?	?	<p>Effect would be dependent on the details of operation, such as the use of energy efficient plant and machinery and renewable energy sources for on-site power.</p>	<p>Not applicable.</p>	<p>Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently</p>	0	0
11. Protect and improve local air quality.	-2	0	<p>Operations would create dust.</p> <p>The mineral would be exported by HGV with an estimated 90 two way movements (45 HGV arrivals and 45 HGV departures) per average working day.</p>	<p>Environmental protection measures to reduce dust.</p>	<p>Mitigation measures would be controlled by planning condition to ensure that the development does not give rise to dust. The operational effect should therefore be neutral.</p>	-1	0

12. Protect and improve water quality and promote efficient use of water.	-1	0	Potential de-watering and discharge into watercourses	Hydrological reports. On-site protection measures to avoid contamination of surface waters and groundwater. Implementation of SuDs. Meeting the requirements of the Environment Agency and Internal Drainage Board (IDB).		-1	0
13. Support wider economic development and promote local job opportunities.	+2	0	This site has the potential to produce a large quantity of aggregate which is important in supporting the wider economy particularly through meeting the demands of the construction industry. There is also the potential for creation of some local job opportunities.	Not applicable.	NPPF paragraph 205 advocates 'great weight' to be given to the benefits of mineral extraction including to the economy. Whilst local jobs will be created the longer term effects of mineral extraction in providing essential housing and infrastructure requirements should be recognised.	+3	0
14. Protect and improve human health and quality of life.	-3	0	There are settlements in close proximity to the site so during the operational phase there could be a negative effect resulting from noise, dust and traffic. In terms of visual amenity, residential properties overlooking the River Trent off Kelham Lane to the south-east would have filtered views and there would be distant views from properties at Little Carlton and South Muskham, though filtered by vegetation. The Trent Valley Way long distance footpath could be adversely affected as it adjoins the site. In the long term there would be no significant effect as restoration is primarily for agriculture and no enhancement of public access to recreational opportunities is proposed.	Environmental protection measures to reduce noise and dust. Transport Assessment. Screen planting. Protection of the Trent Valley Way long distance footpath and improvements to RoW network on restoration.	All environmental mitigation would lessen the potential for impact on sensitive receptors to within acceptable levels. This can be achieved through the adoption of screening and landscape planting. Details would be confirmed at the planning application stage. The overall scoring should be reduced to a potential negative impact.	-2	0
Total	-13	0				-5	+2

Scale	Likely effect on the SA Objective
+3	The proposal is likely to have a very positive impact
+2	The proposal is likely to have a positive impact
+1	The proposal is likely to have a slightly positive impact
0	No significant effect / no clear link
?	Uncertain or insufficient information on which to determine impact
1	The proposal could have a positive or a negative impact depending on how it is implemented
-1	The proposal is likely to have a slightly negative impact
-2	The proposal is likely to have a negative impact

The proposal is likely to have a **very negative** impact

Great North Road South

Sustainability Appraisal Objectives	Effect – Operational Period	Effect – Long Term	Commentary (NCC)	Mitigation (NCC)	Tarmac Comments	Revised Scoring Effect - Operational period	Revised Scoring Effect – Long Term
1. Ensure that adequate provision is made to meet local and national mineral demand.	+2	0	The size of the estimated reserves of this site would contribute positively to meeting national and local demand for sand and gravel.	Not applicable.	Given the locational strategy this site assists in local and wider needs and will secure sand and gravel to the local market as an extension of operations to the north and as well as being well positioned to serve the Leicestershire market following projected cessation of sand and gravel operations in Leicestershire.	+3	0
2. Protect and enhance biodiversity at all levels and safeguard features of geological interest.	-1	+2	<p>The site is immediately adjacent to the River Trent at Staythorpe LWS, the Kelham Road Grassland LWS, the Kelham Shingle Bank LWS and the Old Trent Dyke LWS. There is therefore the potential for direct and indirect impacts to these sites, including though noise, dust, NOx and changes to hydrology and hydrogeology.</p> <p>The proposed restoration is stated as being to agriculture, although it is stated that there is a 'significant opportunity' to create enhanced grassland habitats in the corridor adjoining the Trent. The scheme may therefore deliver at least modest biodiversity benefits. There is potential to create an extensive area of wet grassland (floodplain grazing marsh), which would deliver significant biodiversity benefits if done at scale, and would allow continued use as farmland through grazing. There is also the potential for the establishment of wet woodland next to the Trent, adjacent to existing areas of this habitat</p>	<p>Ecological surveys and hydrological reports.</p> <p>Buffer zones.</p> <p>Appropriate restoration scheme to enhance biodiversity.</p>		-1	+2
3. Promote sustainable patterns of movement and the use of more sustainable modes of transport.	1	0	<p>Extracted material will be transported by conveyor to the Great North Road North site and from there onto the highway network.</p> <p>The site is therefore well related to the main highway network, with direct access off the A616, however the A616 Great North Road junction with A46 is heavily congested at peak times and the A46 around Newark is generally under a capacity strain, therefore lorry routing requires careful consideration.</p>	<p>Imposition of a lorry routing agreement or a similar management control to ensure that HGV traffic avoids inappropriate routes.</p>		1	0

4. Protect the quality of the historic environment, heritage assets and their settings above and below ground.	-2	I	<p>This site is very close to the listed Kelham Bridge and Church of St Wilfrid's, and it is likely to impinge on the setting of the historic parkland that forms part of the setting of Kelham Hall. The parkland is a non-designated heritage asset.</p> <p>It is also in close proximity to Kelham and Averham Conservation Areas. It is immediately adjacent to the listed Smeaton's Arches. It is highly likely that there will be adverse impacts on the settings of these built heritage assets.</p> <p>There are several scheduled monuments within close proximity to the site and the setting of these (along with the non-designated heritage asset "Edinburgh Fort") may be adversely affected. The site also has medium to high potential for non designated archaeology.</p> <p>In the long term the impact on the settings of these heritage assets could be positive or negative, depending on the nature of restoration.</p>	<p>Buffer zones and screening.</p> <p>Archaeological surveys to determine the nature and significance of non-designated remains, then adequate provision to be made for preservation, excavation or recording.</p> <p>Metal detector on conveyor belt to seek metal objects of archaeological interest.</p> <p>Appropriate restoration proposals.</p>		-2	I
5. Protect and enhance the quality and character of our townscape and landscape.	-3	-2	<p>The landscape assessment resulted in a combined landscape score of 85/100 for the operational period so the impact is considered to be very negative. The landscape assessment for post-restoration resulted in a combined landscape score of 72/100 so the impact is considered to be negative.</p>	<p>During the operational phase there would be a screening opportunity along the river and road corridor and a buffer /stand off to protect Old Trent Dyke LWS, the Civil War Redoubt and river corridor should be provided. Restoration should include riparian and road side planting, hedgerow restoration and riverside pasture.</p>	<p>The development would involve the importation of inert materials to achieve restoration largely to agriculture. The long term landscape impact is therefore considered to be less of an impact than stated.</p>	-2	-1
6. Minimise impact and risk of flooding	-3	I	<p>The site is located within Flood Zone 3 (high flood risk area) and the functional flood plain. Sand and gravel workings are considered to be water compatible development which is appropriate in this zone provided that there is no net loss of floodplain storage, water flows are not impeded and flood risk is not increased elsewhere.</p> <p>There is insufficient information at this stage on which to determine the impact of operations and as it is a high risk zone the effect has to be considered as very negative.</p> <p>The Environment Agency has raised particular concern in relation to this site and flood risk, due to its proximity to the villages of Kelham and Averham. Impact in the long-term could be positive or negative depending on the nature of restoration.</p>	<p>Meeting the requirements of the Environment Agency and Internal Drainage Board.</p> <p>Flood Risk Assessment (FRA) including consideration of flood flow and storage.</p> <p>Implementation of SuDs.</p>	<p>This takes an unnecessarily negative stance on the potential for impact. As advised mineral operations are water compatible and flood resilient and compensation would be incorporated as part of any restoration proposals. Operational working would have to consider the potential for flood impact. Restoration offers opportunities for flood resilience measures to be included as part of restoration.</p>	-1	+1

7. Minimise any possible impacts on, and increase adaptability to, climate change.	?	I	During the operational phase the effect would be dependent on the details of operation, e.g. whether the most energy efficient plant and machinery were used. Thereafter, in the long term, the effect could be positive or negative in terms of increasing the resilience of flora and fauna to climate change depending on the details of restoration.	Implement restoration which provides appropriate habitats to help to increase the resilience of flora and fauna.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently.	0	0
8. Protect high quality agricultural land and soil.	-2	?	The site is predominantly Grade 2 and Grade 3a, which is best and most versatile agricultural land, with the remainder being Grade 3b which is not high quality. Restoration is proposed to be to agriculture, but it is not clear whether this would match the existing quality.	Restoration to high quality agricultural land if that is possible.	Good soils management strategies would ensure that the best and most versatile agricultural soils are retained and reused in restoration. The proposals involve the importation of imported inert materials to maximise beneficial restoration. The restored agricultural land would be subject to a 5 year aftercare programme.	-1	-1
9. Promote more efficient use of land and resources.	0	?	No significant effect during the operational period.	Not applicable.		0	0
10. Promote energy efficiency and maximise renewable energy opportunities from new or existing development.	?	?	Effect would be dependent on the details of operation, such as the use of energy efficient plant and machinery and renewable energy sources for on-site power.	Not applicable.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently	0	0
11. Protect and improve local air quality.	-2	0	Operations would create dust. The mineral would be exported by HGV with an estimated 90 two way movements (45 HGV arrivals and 45 HGV departures) per average working day.	Environmental protection measures to reduce dust.	Mitigation measures would be controlled by planning condition to ensure that the development does not give rise to dust. The operational effect should not therefore be significant.	-1	0
12. Protect and improve water quality and promote efficient use of water.	-1	0	Potential de-watering and discharge into watercourses.	Hydrological reports. On-site protection measures to avoid contamination of surface waters and groundwater. Implementation of SuDs. Meeting the requirements of the Environment Agency and Internal Drainage Board (IDB).		-1	0

13. Support wider economic development and promote local job opportunities.	+2	0	This site has the potential to produce a large quantity of aggregate which is important in supporting the wider economy particularly through meeting the demands of the construction industry. There is also the potential for creation of some local job opportunities.	Not applicable.	NPPF paragraph 205 advocates 'great weight' to be given to the benefits of mineral extraction including to the economy. Whilst local jobs will be created the longer term effects of mineral extraction in providing essential housing and infrastructure requirements should be recognised.	+3	0
14. Protect and improve human health and quality of life.	-2	0	There are settlements in close proximity to the site so during the operational phase there could be a negative effect resulting from noise, dust and traffic. In terms of visual amenity, there would be no significant detrimental effect on residential properties. The Trent Valley Way long distance footpath would be disrupted by the conveyor route. In the long term there would be no significant effect as restoration is primarily for agriculture and no enhancement of public access to recreational opportunities is proposed.	Environmental protection measures to reduce noise and dust. Transport Assessment. Protection of the Trent Valley Way long distance footpath and improvements to RoW network on restoration.	All environmental mitigation would lessen the potential for impact on sensitive receptors to within acceptable levels. This would be confirmed at the planning application stage. The overall scoring should be reduced to a potential minor negative impact.	-1	0
Total	-12	0				-4	+1

Scale	Likely effect on the SA Objective
+3	The proposal is likely to have a very positive impact
+2	The proposal is likely to have a positive impact
+1	The proposal is likely to have a slightly positive impact
0	No significant effect / no clear link
?	Uncertain or insufficient information on which to determine impact
1	The proposal could have a positive or a negative impact depending on how it is implemented
-1	The proposal is likely to have a slightly negative impact
-2	The proposal is likely to have a negative impact
-3	The proposal is likely to have a very negative impact

Botany Bay

Sustainability Appraisal Objectives	Effect – Operational Period	Effect – Long Term	Commentary (NCC)	Mitigation (NCC)	Tarmac Comments	Revised Scoring Effect - Operational period	Revised Scoring Effect – Long Term
1. Ensure that adequate provision is made to meet local and national mineral demand.	+2	0	The size of the estimated reserves of this site would contribute positively to meeting national and local demand for sand and gravel.	Not applicable.	Given the locational strategy this relatively large site assists in contributing to local and wider needs and will likely secure sand and gravel to the South Yorkshire markets.	+3	0
2. Protect and enhance biodiversity at all levels and safeguard features of geological interest.	-1	+1	<p>The Chesterfield Canal (Shireoaks to Welham) LWS demarcates the southern site boundary, Sutton and Lound Gravel Pits SSSI and Idle Valley Nature Reserve LWS lie to the north-east. There is therefore the potential for direct and indirect impacts on these sites, including from noise, dust, NOx and changes to hydrology and hydrogeology.</p> <p>Restoration would be to a combination of water-based nature conservation and agricultural land use to complement existing land uses and landscape character within the vicinity (including the presence of the Chesterfield Canal and Nature Reserves within the local area). This would not maximise the biodiversity gain that could be achieved on the site.</p>	<p>Ecological surveys and hydrological reports.</p> <p>Buffer zones.</p> <p>Appropriate biodiversity-led restoration scheme to deliver creation of appropriate priority habitats, with restoration to arable farmland restricted to the current amount of high quality agricultural land.</p>	<p>The views into the site from the adjoining canal are relatively minor and localised and therefore should not be considered as significant in the context of the other industrial land use settings along the route of the canal.</p> <p>The restoration scheme will deliver a visually interesting wetland habitat adjoining the canal.</p>	-1	+1
3. Promote sustainable patterns of movement and the use of more sustainable modes of transport.	+1	0	The site is well related to the main highway network, with direct access off the A638.	Not applicable.		+1	0
4. Protect the quality of the historic environment, heritage assets and their settings above and below ground.	-1	1	<p>This site is bounded by the non designated heritage asset of the Chesterfield canal and includes Lady Bridge, a C18th brick canal bridge, which could be potentially adversely affected.</p> <p>The setting of listed buildings, including Ranby Hall and buildings associated with the Babworth Park Estate, which is a registered park and garden, could be affected.</p> <p>The potential for non-designated archaeology at this site is medium and the level of risk is medium. In the long term the impact on these designated heritage</p>	<p>Buffer zones and screening.</p> <p>Archaeological surveys to determine the nature and significance of any remains, then adequate provision to be made for preservation, excavation or recording.</p> <p>Metal detector on conveyor belt to seek metal objects of archaeological interest.</p>		-1	1

			assets could be positive or negative depending on the nature of the restoration.				
5. Protect and enhance the quality and character of our townscape and landscape.	-3	-2	The landscape assessment resulted in a combined landscape score of 82/100 for the operational period so the impact is considered to be very negative. The landscape assessment for post-restoration resulted in a combined landscape score of 60/100 so the impact is considered to become negative.	During the operational phase a landscape buffer will be required to the A638 and the Chesterfield Canal. Restoration should include replacement of the hedge lines (refer to species list for the Idle Lowlands LCA, not including Ash).	The mitigation section refers to necessary mitigation strategies to lessen impact. If these are implemented it is considered that the negative impact would be reduced. Long term the land will be restored largely to agricultural use using the importation of inert infill material. Long term impact is therefore reduced	-2	-1
6. Minimise impact and risk of flooding	-1	0	The site is in Flood Zone 1 (low probability of flooding).	Meeting the requirements of the Environment Agency and Internal Drainage Board. Implementation of SuDs.	The assessment on impact should be neutral as it is not in an area sensitive to flooding.	0	0
7. Minimise any possible impacts on, and increase adaptability to, climate change.	?	1	During the operational phase the effect would be dependent on the details of operation, e.g. whether the most energy efficient plant and machinery were used. Thereafter, in the long term, the effect could be positive or negative in terms of increasing the resilience of flora and fauna to climate change depending on the details of restoration.	Implement restoration which provides appropriate habitats to help to increase the resilience of flora and fauna.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently.	0	0
8. Protect high quality agricultural land and soil.	-1	?	Approximately 64% of the site is Grade 3b (not high quality) agricultural land, with smaller areas of Grade 3a (approximately 29%) and Grade 2 (approximately 7%) which are best and most versatile agricultural land. The majority of the site, therefore, is not within the best and most versatile agricultural land categories. Proposed restoration would include some agricultural land, but it is not clear whether it would match the existing quality.	Restoration to high quality agricultural land if possible.	Good soils management strategies would ensure that the best and most versatile agricultural soils are retained and reused in restoration. The proposals involve the importation of imported inert materials to maximise beneficial restoration. The restored agricultural land would be subject to a 5 year aftercare programme.	-1	+1
9. Promote more efficient use of land and resources.	0	?	No significant effect during the operational period.	Not applicable.		0	0

10. Promote energy efficiency and maximise renewable energy opportunities from new or existing development.	?	?	Effect would be dependent on the details of operation, such as the use of energy efficient plant and machinery and renewable energy sources for on-site power.	Not applicable.	Standard good practice and environmental management codes used by the operator ensure that plant and machinery operated efficiently	0	0
11. Protect and improve local air quality.	-2	0	Operations would create dust. The mineral would be exported by HGV with an estimated 72 two way movements (36 HGV arrivals and 36 HGV departures) per average working day.	Environmental protection measures to reduce dust.	Mitigation measures would be controlled by planning condition to ensure that the development does not give rise to unacceptable levels of dust. The operational effect should therefore not be significant.	-1	0
12. Protect and improve water quality and promote efficient use of water.	-2	0	Potential de-watering and discharge into watercourses. The site is situated on a primary aquifer, which could be of concern from a groundwater perspective.	Hydrological reports. On-site protection measures to avoid contamination of surface waters and groundwater. Meeting the requirements of the Environment Agency and Internal Drainage Board.	Water management would be carried out through formal water Abstraction and Discharge permits. Impacts likely to be temporary and localised. Groundwater monitoring / mitigation strategies can be developed and delivered based on adopted schemes for existing operational sand and gravel sites (eg Langford Quarry)	-1	0
13. Support wider economic development and promote local job opportunities.	+2	0	This site has the potential to produce a large quantity of aggregate which is important in supporting the wider economy particularly through meeting the demands of the construction industry. There is also the potential for creation of some local job opportunities.	Not applicable.	NPPF paragraph 205 advocates 'great weight' to be given to the benefits of mineral extraction including to the economy. Whilst local jobs will be created the longer term effects of mineral extraction in providing essential housing and infrastructure requirements should be recognised.	+3	0
14. Protect and improve human health and quality of life.	-2	0	The site is in close proximity to settlements so during the operational phase there could be a negative effect resulting from noise, dust and traffic. In terms of visual amenity, there would be a significant adverse change to views from a limited number of residential properties. No RoWs are directly affected, but the Chesterfield Canal towpath, which adjoins the southern site boundary, could potentially be affected by noise and dust during the operational phase.	Environmental protection measures to reduce noise and dust. Transport Assessment. Public access opportunities to nature conservation areas as part of restoration scheme.		-2	0

			No enhancement of public access to recreational opportunities is included in the restoration proposals.				
Total	-8	-1				-2	+1

Scale	Likely effect on the SA Objective
+3	The proposal is likely to have a very positive impact
+2	The proposal is likely to have a positive impact
+1	The proposal is likely to have a slightly positive impact
0	No significant effect / no clear link
?	Uncertain or insufficient information on which to determine impact
1	The proposal could have a positive or a negative impact depending on how it is implemented
-1	The proposal is likely to have a slightly negative impact
-2	The proposal is likely to have a negative impact
-3	The proposal is likely to have a very negative impact