

# Caulmert Limited

Engineering, Environmental & Planning  
Consultancy Services

**Wasperton Farm Quarry**

**Smiths Concrete Limited**

**Environmental Permit Application**

**Environmental Setting & Site Design Report**

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## 1.0 INTRODUCTION

### 1.1 Overview

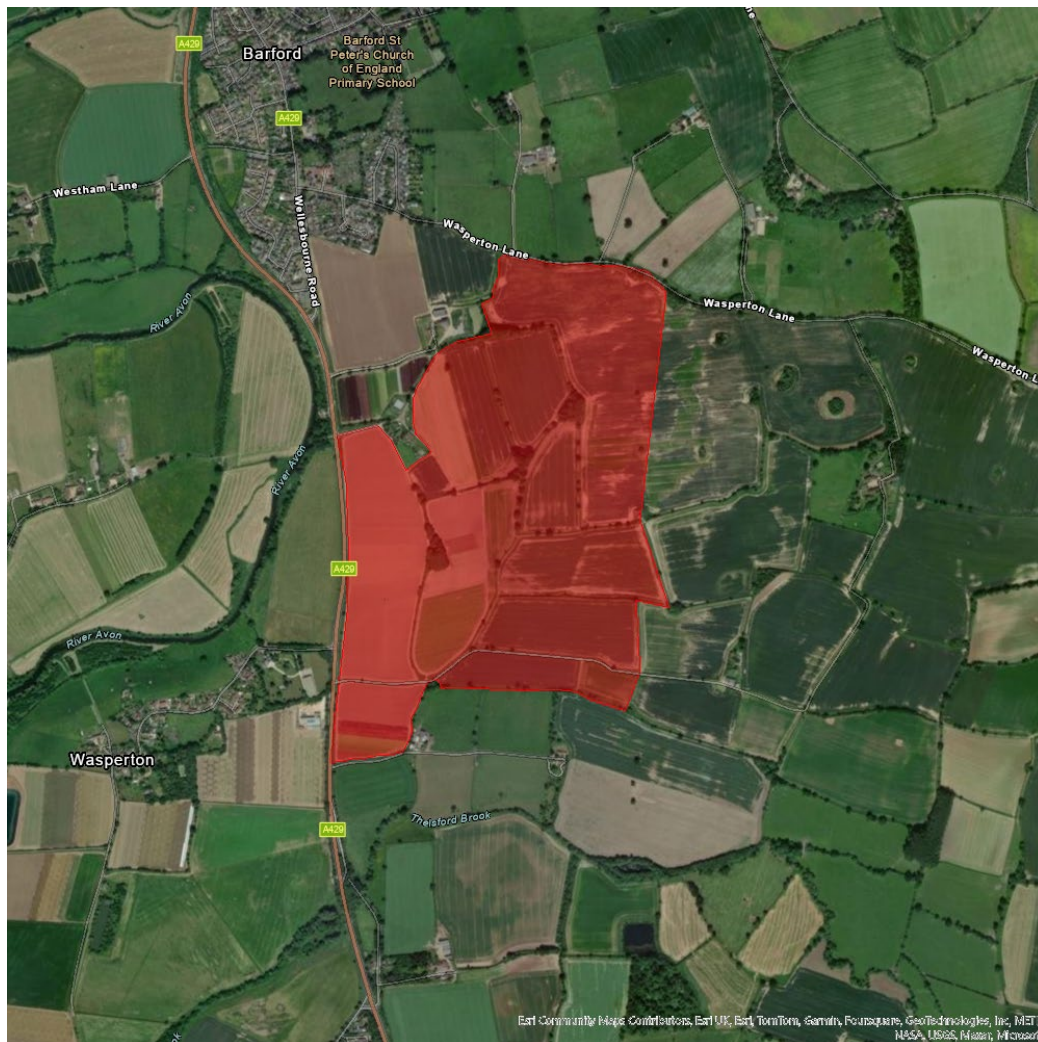
- 1.1.1 Caulmert Limited have been appointed by Smiths Concrete Limited ('the Operator') to prepare a new bespoke environmental permit application for a waste recovery operation at Wasperton Farm Quarry ('the Site'), located within an agricultural area in the vicinity of Holloway Farm and Wasperton Farm, close to the town of Barford, Warwickshire.
- 1.1.2 The Site is being developed as a sand and gravel quarry by Smiths Concrete Limited in an area between Wasperton Farm and Holloway Farm.
- 1.1.3 As part of this, the Operator proposes to import 500,000 tonnes per annum of inert waste materials, with a total of 1.2 million tonnes of imported materials required to complete the restoration. It is proposed to return a larger part of the site to agricultural land after quarrying, in 12 phases and restoring the site to the required restoration levels.
- 1.1.4 Imported inert materials will undergo strict waste acceptance procedures prior to being accepted into the recovery operation.
- 1.1.5 Within this ESSD report, a Conceptual Site Model (CSM) is provided which details the site-specific Source>Pathway>Receptor linkages for risk assessments within this permit application.
- 1.1.6 The Final Restoration of Phases 1-12 is shown in attached drawing ref. LD135-WSP-005d.

### 1.2 Site Location & Surrounding Land-Use

- 1.2.1 Wasperton Farm is located between Barford and Wellesbourne, to the east of the A429. The Site sits in the Warwick District administrative area and more locally is within the joint parish Council area of Barford, Sherbourne and Wasperton parishes.
- 1.2.2 The site is set within predominantly agricultural land. The Site is currently used for arable farming with a mix of crops being grown. Also within the Site are a number of small tree blocks, which are a mix of natural and planted areas.
- 1.2.3 To the north of the Site is Wasperton Lane, with Barford village centre being further north of Wasperton Lane. To the east, the land rises to Wasperton Hill. To the south the land is generally flat farmland falling very gently to the Thelsford Brook. The western boundary is formed by the A429 Wellesbourne Road, with Wasperton village sitting to the west of the road between the A429 and the River Avon
- 1.2.4 The proposed area to be quarried and infilled with inert materials occupies part of Wasperton Farm. The area covers nearly 90 hectares but only 54 hectares are proposed to be quarried and then restored with inert materials. The planning application boundary (the red line boundary on attached drawing ref. LD135-WSP-024) extends from Wasperton Lane in the north, to the fields immediately south of bridleway 101a close to Wasperton village. The

western boundary is the A429 and includes a short section of the public highway where a traffic light junction is proposed as part of the quarry and waste recovery activity access.

- 1.2.5 The eastern boundary falls approximately at the break of slope between Wasperton Farm and Wasperton Hill Farm. To the immediate north of the application area are Holloway and Wasperton farmhouses and associated ranges of farm structures, which sit outside the proposed site area. Sandy Way (the closest part of Barford Village to the Site) sits approximately 325m from the site boundary. Wasperton village is 240m from the nearest active extraction and waste recovery area.
- 1.2.6 The site location is shown in attached drawing ref. 3242-HIA-01 within Appendix 1, an extract is shown below in Figure 1.



**Figure 1 – Site Location (planning boundary in red)**

## 2.0 SOURCE TERM CHARACTERISATION

### 2.1 Development & Planning History

- 2.1.1 The Wasperton Farm Site is predominantly rural comprising two farmhouses and a range of assorted aged farm buildings. Wasperton Farmhouse is Grade II listed. The Site area has been in continual agricultural use since at least 1995 (according to Google Earth imagery).
- 2.1.2 Figure 2 below sets out the relevant planning history (summary taken from the recent planning application) for the Site based on the online planning records at both Warwick District and Warwickshire County Council. Much of the planning history relates to the agricultural uses in locations around the main Wasperton and Holloway Farms buildings, and outside the proposed quarry area.
- 2.1.3 Of the planning applications approved, only one is considered relevant to the current application (W/02/CC111 – for the Barford bypass). Two refused planning applications are also relevant. These are from 2018 (a refused poly tunnel application) and December 1993 (a sand and gravel quarry application - refused on appeal).

| Ref                                                  | Proposal                                                                                                                                                                                                                                                                                                                                                                                   | Location of development within the Site                                              | Decision Date | Decision                   |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|----------------------------|
| Ref. No: W/17/0446                                   | Change of use from agricultural to B8 (open storage).                                                                                                                                                                                                                                                                                                                                      | Immediately east of the existing Wasperton Farm, Buildings (north of quarry Phase 4) | 21/09/2017    | Withdrawn                  |
| Ref. No: W/16/1927                                   | Various alterations and repairs including to the roof, windows and doors                                                                                                                                                                                                                                                                                                                   | Wasperton Farm House                                                                 | 08/02/2017    | Permission not required    |
| Ref. No: W/94/0832                                   | Erection of extension to Dutch barn.                                                                                                                                                                                                                                                                                                                                                       | Northern most barn at Wasperton Farm                                                 | 13/09/1994    | Approved                   |
| Ref. No: W/87/1438<br>(This is also W/87/1438 below) | Extraction and processing of sand and gravel and the subsequent restoration to agricultural and l...                                                                                                                                                                                                                                                                                       | Wasperton Hill Farm                                                                  | 21/12/1993    | Refused - called in appeal |
| Ref. No: W/18/0953                                   | Erection of a poly-tunnel for the production of hydroponically grown crops.                                                                                                                                                                                                                                                                                                                | Field due east of The Forge Cottage                                                  | 14/11/2018    | Refused                    |
| Ref. No: W/17/0256/AG                                | Erection of multi-span polytunnel for growing salad and herb crops                                                                                                                                                                                                                                                                                                                         | Field due east of The Forge Cottage                                                  | 23/03/2017    | Withdrawn                  |
| Ref. No: W/05/1221                                   | Renewal of permission for the stationing of a converted wagon for use as a farm stand to sell farm produce                                                                                                                                                                                                                                                                                 | Retention of stand granted under Ref. No: W/01/0519                                  | 12/09/2005    | Refused                    |
| Ref. No: W/01/1249/AG                                | Erection of a polytunnel.                                                                                                                                                                                                                                                                                                                                                                  | North of existing polytunnels - north of main Holloway Farm buildings                | 10/10/2001    | Approved                   |
| Ref. No: W/01/0519                                   | The stationing of a converted wagon for use as a farm stand to sell farm produce.                                                                                                                                                                                                                                                                                                          | Stand adjacent to Holloway Farm House.                                               | 26/07/2001    | Approved                   |
| Ref. No: W/01/0444/AG                                | Erection of 2 polytunnels.                                                                                                                                                                                                                                                                                                                                                                 | North of Holloway Farm access road                                                   | 02/05/2001    | Approved                   |
| Ref. No: W/84/0924                                   | Investigative operations to determine the extent and quality of any minerals                                                                                                                                                                                                                                                                                                               | Wasperton Hill Farm                                                                  | 07/11/1984    | Approved                   |
| W/87/1438 (This is also ref: W/87/1438)              | Extraction and processing of sand and gravel and the subsequent restoration to agriculture and landscaped lakes                                                                                                                                                                                                                                                                            | Wasperton Farm - proposed development site.                                          | 08/04/1988    | Refused                    |
| W/02/CC111                                           | A 7.3m single carriageway road 2.1km long overwidened at the southern and northern junctions to provide ghost islands for right-turning traffic. The verges are generally 3.5m wide but overwidened where necessary to provide visibility. The bypass requires the construction of a four-span viaduct and a series of flood culverts where it crosses the River Avon and the flood plain. | A429 road improvements                                                               |               | Approved                   |

Figure 2 – Planning History for the Site (extract from 2022 planning application)

- 2.1.4 There are no records of any pollution incidents, leaks or spills of hazardous substances in the area, or any visual evidence of contamination in the ground.
- 2.1.5 From the Planning Application, evidence suggests contamination of the site is highly unlikely, due to the following factors:
- The whole site has been drilled down to the underlying clays (over 60 boreholes) as part of a Geological Site Investigation into the mineral reserves by Greenfields Environmental Ltd in 2019, but no evidence of anything but the natural ground has been encountered across the whole site. This has included the installation of piezometers to monitor the groundwater.
  - The whole site has been subject to an archaeological desk-based assessment of historic mapping and HER records across the Site, supported by a geophysical survey of all of the excavation areas. The latter shows only agricultural drains across the Site with no evidence of ground disturbance that might imply any historic non-agricultural uses and the former produced no mapping evidence to suggest that the Site has had uses other than agriculture.
  - There is no visual evidence of any contamination across the fields or in the ponds and ditches.
  - The farm has, for many decades, been producing fresh edible produce from all of the areas that are to be worked. This includes cereals and salad crops. Production of these crops for human consumption would suggest that the Site is only subject to the usual agricultural practices and that no unacceptable pollution exists on site.

## **2.2 Proposed Development**

- 2.2.1 The Operator proposes to import up to 500,000 tonnes per annum of inert wastes to the Site as a recovery operation in order to achieve the required restoration levels stipulated within the planning application. It is proposed a total of 1.2 million tonnes of inert wastes materials will be required in order to complete the site. The quarry will be worked in a phased manner (a total of 12 phases) and reinstated using site-won overburden and imported inert materials to restore the agricultural land in Phases 2-12, together with a new area of ecological wetland habitat in Phase 1.

### Planning Application 2022

- 2.2.2 A planning application (ref. WDC/22CM008) has been submitted to Warwickshire County Council in November 2022 which relates to a proposal to develop a sand and gravel quarry at Wasperton Farm, Barford Warwickshire. The planning application includes for the reinstatement of the quarry void using imported inert construction and demolition waste materials, and the restoration of the Site to agricultural use and dedicated bio-diverse semi aquatic habitat.

- 2.2.3 The planning application proposes a sand and gravel quarry that will release approximately 2.27 million tonnes of unprocessed sand and gravel (of which 1.835 million tonnes will be saleable) suitable for construction use. The difference between 2.27 million tonnes and 1.835 million tonnes is the mineral that sits beneath the hedges, woodlands and their stand offs, which are all being retained as part of the environmental mitigation for the development. Overburden equates to 758,000m<sup>3</sup> comprising approximately 460,000 m<sup>3</sup> of top and sub soils, and approximately 300,000 m<sup>3</sup> of clay overburden beneath the soils.
- 2.2.4 The planning application area extends to approximately 89.5 ha (edged in red on drawing ref. LD135-WSP-024), which includes the identified mineral extraction area occupying 53.5 ha and the rest barren areas to be used for temporary soil storage and screening. The proposed quarry is expected to have the operational life of approximately 10-15 years based on anticipated production levels.
- 2.2.5 The Site is owned by St Johns College, Oxford and is operated as a tenanted farm. Smiths has an option to lease the Site should planning permission be granted for the winning and working of mineral. The intention is that the farm will continue in operation whilst the mineral extraction is undertaken. Farmland will be acquired in phases from the farm as the operations progress. Similarly, as areas are restored, so those areas will be released to the farm on a phased basis.

## 2.3 Proposed Restoration & Phasing

- 2.3.1 It is proposed to undertake waste recovery activities at Wasperton Farm Quarry in order to restore the sand and gravel quarry working to the restoration levels. This will be done in a phased manner, in Phases 1 to 12, as per the following drawings:

- LD135-WSP-008b Phase 1 – Initial Site Set-Up
- LD135-WSP-009b Phase 2
- LD135-WSP-010b Phase 3
- LD135-WSP-011b Phase 4
- LD135-WSP-012b Phase 5
- LD135-WSP-013b Phase 6
- LD135-WSP-014b Phase 7
- LD135-WSP-015b Phase 8
- LD135-WSP-016b Phase 9
- LD135-WSP-017b Phase 10
- LD135-WSP-018a Phase 11
- LD135-WSP-019b Phase 12
- LD135-WSP-006b Plant Site – Detailed Layout
- LD135-WSP-005d Final Restoration Phases 1-12 restored

- 2.3.2 A new area of ecological wetland habitat will be developed in Phase 1 which will enhance long-term biodiversity at the site. As the restoration scheme will leave approximately 5 ha of

restored wetland habitat, so the scheme will generate a surplus of top and subsoils. This surplus will be used to enhance the final restoration.

- 2.3.3 The layout of the restored site is shown in attached drawing ref. LD135-WSP-005d 'Wasperton Final restoration Phases 1-12 restored' (see also extract of this drawing in Figure 3 below).
- 2.3.4 Phases 2 to 12 will be reinstated as high-grade agricultural land, and the operator will use site-won overburden, together with imported inert waste materials to achieve final agreed restoration contours. Original soils will be replaced on top to reinstate the high-quality agricultural land. Soils stripped from each phase will either be used directly in site restoration or placed into temporary stores for later use and to screen active working operations.
- 2.3.5 Initial Site set-up for the quarry is expected to take 12-18 months. This will be the most extensive part of the development and will comprise the stripping of soils in phases 1, 2, 11 and 12 and possibly a small part of Phase 3.
- 2.3.6 Phase 1 will form the water recirculatory system. This will comprise a silt settling pond and three clean water lagoons. Soils will be stripped and stored in low bunds on the western and eastern boundary of the phase. The majority of Phase 1 soils will be stored on Phase 11.
- 2.3.7 Phase 2 will be stripped and used to store the sand and gravel from Phase 1 in a mound up to 3m high. Soils from phase 2 will be stored on the northern boundaries of Phase 2 in bunds up to 3 m high. Excess soils will be stored in Phase 11.
- 2.3.8 Phase 12 soils will be stripped and used to create a 5m high bund around the perimeter of the plant site. Once clear of soils, the plant site will be surcharged with 1m of sand and gravel from Phase 1. This is because the water table sits at the soil/mineral interface. Surcharging the plant site with mineral will maintain a dry running surface for the plant site while it is operational.
- 2.3.9 Phase 11 topsoil will be stripped to create a silt storage area for Phases 1 and 2.
- 2.3.10 The site access road will be stripped of soils and an approximately 2m high bund will be created north and south of the access road to act as a visual and noise barrier. This road will connect the plant site to the A429.
- 2.3.11 Once the plant site is prepared, the proposed buildings, structures and plant will be installed and commissioned, and the plant will be connected to the silt lagoon system.
- 2.3.12 Once the plant systems are operational, the Phase 1 sand and gravel stored on Phase 2 will be fed into the plant for processing and onward sale and from thereon quarrying of the phases will continue and infilling with materials for restoration will begin.
- 2.3.13 The proposed quarry is expected to have the operational life of approximately 10-15 years based on anticipated production levels, and therefore the proposed backfilling and reinstatement is expected to run 6 -12 months behind the mineral extraction.

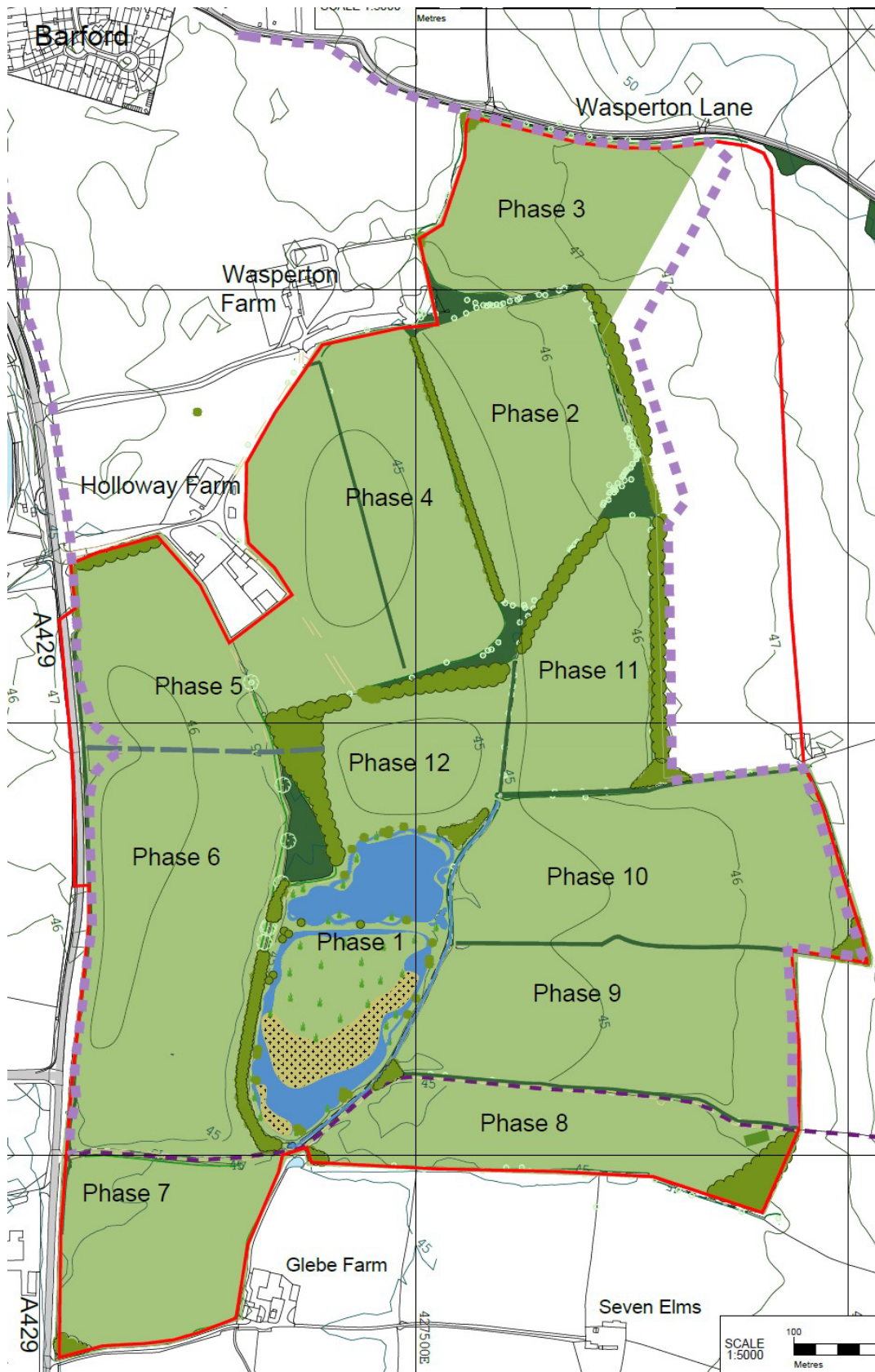


Figure 3 –Final restoration of the Site and phases (extract from LD135-WSP-005d)

### Control Measures & Emissions

- 2.3.14 The site is viewed as being in a sensitive location with respect to the groundwater present within the underlying Secondary A Aquifer (within the sands and gravels) and the close proximity to the River Avon. It is proposed to place inert wastes as part of the restoration of the site below the current groundwater elevation and therefore it is likely the site will be sub-water table when groundwater levels rebound once dewatering ceases upon completion of the site. An additional assessment has been presented in the Hydrogeological Risk Assessment report ref. 5526-CAU-XX-XX-RP-O-0305 and forms the basis for the specification of an attenuation layer prior to the placement of the inert restoration materials. The risk assessment presented within the HRA indicates that an attenuation layer consisting of a minimum thickness of 0.5m, at a minimum hydraulic conductivity of  $1 \times 10^{-7}$  m/s, is sufficient and that there will be no discernible impact on the surrounding groundwater.
- 2.3.15 The only other possible sources of contamination from the proposed restoration activities will be limited to any possible leaks and spills of fuel or oils from vehicles and plant used on site. The placement of restoration materials (inert wastes) has also been considered regarding its potential as a source of contamination, but due to the inert nature of the wastes, the risk of being a source of contamination is considered negligible. The main sensitive receptor will be the surface water within the River Avon and tributaries around the site (also designated a Local Wildlife Site). The groundwater within the superficial deposits (Secondary A Aquifer) is also a sensitive receptor, however these are to be quarried out on site. The bedrock below is classified as a Secondary B Aquifer, defined as an aquifer with lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.
- 2.3.16 Emissions control measures and strict waste acceptance procedures will be in place at the site and will be included within the site's Environmental Management System. These waste acceptance and control measures will cover the proposed restoration works at the site. This will ensure environmental pollution is prevented and only inert waste types are accepted. The inert wastes for restoration are inherently uncontaminated and do not pose a risk of leaching contaminants. Any non-conforming wastes will be rejected from site. All plant, vehicles and machinery used on site will be regularly checked for leaks and maintained and serviced in accordance with manufacturers guidance. Where refuelling is undertaken on site, this will be done in a designated refuelling area with spill kits available. The use of biodegradable oils and lubricants will be considered where practicable. Static machinery and plant will, where practicable, have integral drip trays of 110% of the capacity of the fuel tank. All staff and contractors will be inducted into the emergency spill procedure and use the spill kits and booms provided to clean up any spillages as quickly as possible. Any storage of hazardous substances, if required, will be above ground in sealed, impervious, fully bunded tanks or containers, with 110% secondary containment. Suspended sediment run-off will be unlikely from site operations and will be controlled during the restoration.
- 2.3.17 Emissions such as odour, noise & vibration and dust and possible accidents such as spillages have been considered in the Environmental Risk Assessment report ref. 5526-CAU-XX-XX-RP-

V-0302 as part of this permit variation application. A Dust & Emissions Management Plan (DEMP) has also been produced (ref. 5526-CAU-XX-XX-RP-V-0304) covering the restoration activities at the site and detailing control measures for dust on-site as a result of the proposed recovery activity.

## 2.4 Permitted Waste Types & Quantities

### Waste Types

- 2.4.1 Permitted wastes accepted at the site will be strictly inert, and by definition, such waste material will not be capable of generating a leachate that could pose a risk to the groundwater or surface water environment. The potential impact from the placement of restoration soils within the Site is considered to be negligible. The proposed waste types are restrictive and in line with those accepted in standard rules permits where no assessment of the risks to groundwater is considered necessary.
- 2.4.2 The EWC waste codes to be accepted onto site for restoration are listed in the Waste Recovery Plan (WRP) ref. 5526-CAU-XX-XX-RP-V-0301.
- 2.4.3 The waste types selected are identified by the Environment Agency as suitable for use in the restoration of mineral workings and as general fill material in Environment Agency guidance 'Waste recovery plans and deposit for recovery permits', last updated 29<sup>th</sup> June 2023.

### Waste Quantities

- 2.4.4 As there is insufficient material on-site to complete the restoration of the quarry, the shortfall of material will be sourced from imported inert wastes. The overall revised restoration scheme requires a total of 966,700 m<sup>3</sup> or 1.2 million tonnes of material for the restoration of Wasperton Farm Quarry.
- 2.4.5 Overburden and overlying soils on-site equates to 758,000m<sup>3</sup> comprising approximately 460,000 m<sup>3</sup> of top and sub soils, and approximately 300,000m<sup>3</sup> of clay overburden beneath the soils. The overburden consists of a mix of clays and clay-rich sand and gravels. It is therefore anticipated that an estimated 966,700m<sup>3</sup> (equating to approximately 1.2 million tonnes) will consist of imported materials required for the restoration of Wasperton Farm Quarry. The proposed scheme requires an infill rate of 500,000 tonnes per year to complete.
- 2.4.6 Sidewall attenuation layers will be constructed in each phase to provide additional groundwater protection, but basal attenuation layers are not considered necessary as the sand and gravel deposits will be quarried out down to the mudstone, which will act as an impermeable barrier to vertical migration of groundwater. The Hydrogeological Risk Assessment (HRA) ref. 5526-CAU-XX-XX-RP-O-0305 modelled the attenuation layer thicknesses for the sides of the quarry, using site won material (overburden) and suitable imported inert materials where required. The HRA concluded that a minimum thickness of 0.5m, at a minimum hydraulic conductivity of  $1 \times 10^{-7}$  m/s was sufficient to ensure protection of the groundwater environment. New recovery permit material will be placed above this

attenuation layer. The attenuation layers will be constructed to Construction Quality Assurance (CQA) standards in accordance with an approved CQA Plan, to be submitted to the Environment Agency for approval prior to works being undertaken.

#### Method of placement

- 2.4.7 A scheme of infilling and restoration will ensure that all existing soils remaining on site can be integrated for final restoration of the site and placed in accordance with consented levels. The inert restoration materials will be sufficiently compacted to form a stable surface for the medium- and long-term and would undergo consolidation rapidly to reduce the risk of short-term instability.
- 2.4.8 It is proposed to work the sand and gravel 'dry', which will require dewatering due to the presence of groundwater within the deposit. The Site will then be restored progressively to agricultural land using imported inert fill and site derived overburden, deposited into the dewatered voids. No materials will be deposited into water.
- 2.4.9 The method of placement has been designed to consider the physical and technical requirements for the restored landform in terms of land stability, drainage and other factors such as the inclusion of landscape features in keeping with the surrounding landscape character. The method of placement and environmental considerations are detailed in the Waste Recovery Plan (WRP) document ref. 5526-CAU-XX-XX-RP-V-0301.
- 2.4.10 Excavated inert waste materials will be delivered to site using appropriate road going vehicles. The materials will then be bladed out in layers and compacted using mechanical plant used for the spreading activities. The restoration soils shall be spread in layers to the required thickness to form a smooth even profile without undulations, hollows or depressions.
- 2.4.11 The site will operate according to the Waste Acceptance Procedures as detailed in the Waste Recovery Plan, to ensure that all incoming and received wastes are fit for purpose, suitable for design and construction and not contaminated. Final ground levels and landscaping will ensure that the site does not result in any environmental problems including soil erosion, pollution or flooding.

## **2.5 Hydrogeological Risk Assessment**

### Hydrogeological Impact Assessment

- 2.5.1 A Hydrogeological Impact Assessment (HIA) has been undertaken as part of the planning application for the Site and is attached as document ref. 3242/HIA Version F2 (Appendix 1).
- 2.5.2 The HIA is an assessment of the impacts associated with quarrying and infilling operations at the proposed site and has been made with consideration of groundwater and surface water flows and quality, proximity to local areas of ecological interest and water abstractions. The potential impacts of the proposed operation and restoration have been assessed against the extant, greenfield conditions.

- 2.5.3 During mineral extraction dewatering is considered likely to only impact the water features internal and immediately adjacent to the site. However, as these features are both groundwater and run-off supported the impacts are likely to be minor.
- 2.5.4 Following restoration, decreased groundwater recharge is anticipated to be balanced by increased run-off. As the ditches will be retained, are connected with the waterbodies, and ultimately convey water to the same watercourse that the groundwater discharges to, the overall impact will be minor.
- 2.5.5 The potential of imported restoration material to degrade water quality is considered to be minor due to the strict adherence to Waste Acceptance Criteria (WAC) to regulate the waste placed at the site. Any further mitigation measures would be identified during the permitting process.
- 2.5.6 It is considered that there will be no cumulative impacts associated with the proposed development of the site due to the absence of other quarries or waste recovery activities in the vicinity.

#### Hydrogeological Risk Assessment

- 2.5.7 This section reviews the potential for pollution to arise from the importation of waste material for recovery / restoration purposes in accordance with the current guidance<sup>1</sup>. The site is viewed as being in a sensitive location with respect to the groundwater present within the underlying Secondary A Aquifer (within the sands and gravels) and the close proximity to the River Avon. It is proposed to place inert wastes as part of the restoration of the site sub-water table, which increases the risk to groundwater once dewatering ceases upon completion of the site. The detailed environmental setting has been reported in the Environmental Setting & Site Design (ESSD) report ref. 5526-CAU-XX-XX-RP-V-0303, however an additional assessment has been presented in the Hydrogeological Risk Assessment report ref. 5526-CAU-XX-XX-RP-O-0305 and forms the basis for the specification for the attenuation layer.
- 2.5.8 The placement of restoration materials will operate as a recovery activity and consequently, this activity does not fall within the requirements of the Landfill Directive. The attenuation layer has been proposed on the basis of risk as outlined in the current guidance. The risk assessment presented within the HRA indicates that an attenuation layer consisting of a minimum thickness of 0.5m, at a minimum hydraulic conductivity of  $1 \times 10^{-7}$  m/s, is sufficient and that there will be no discernible impact on the surrounding groundwater.
- 2.5.9 Strict waste acceptance procedures will be in place at the site to ensure only inert material is accepted. Within the HRA model, the acceptance criteria is based on those for inert WAC, in which the waste has been modelled using the C0 values provided in Section 2.1.2.1 of European Council Decision 2003/33/EC. These are considered most likely to represent the initial peak concentrations of contaminants in leachate.

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<sup>1</sup> <https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-recovery-plans-and-deposit-for-recovery-permits>

- 2.5.10 Modelling results indicate there will be no discernible impact on the surrounding groundwater from the proposed restoration materials. Sensitivity analysis was undertaken on the model, using the potential for rogue loads of non-inert material, which indicated that there would be no significant impact on the groundwater.
- 2.5.11 The site will have no leachate management system. It is assumed no leachate will be generated during the operational and post-operational phases following restoration. Therefore, no leachate management is proposed. The quarry will be dewatered during the operational phase and as such inert wastes will be placed sub-water table. Groundwater levels will be frequently checked during extraction of phases and groundwater management will cease upon completion of the restoration of the entire site.
- 2.5.12 Groundwater monitoring will be undertaken on perimeter boreholes already installed on the perimeter of the site. Baseline monitoring data will be undertaken for a minimum of 12 months prior to deposition of recovery materials. The monitoring suite and frequency is outlined within the HRA report.

## **2.6 Landfill Gas Screening Report**

- 2.6.1 It is considered that the proposed inert wastes to be accepted at the site will be stable, unreactive and not contain biodegradable fractions, thus very unlikely to produce significant volumes of landfill gas which would otherwise require control by site engineering or positive extraction, therefore risks posed to receptors from landfill gas migration is negligible.
- 2.6.2 The site will accept inert waste only until the end of the recovery operation. In-situ native soils will also be used.
- 2.6.3 In accordance with Environment Agency guidance 'Waste recovery plans and deposit for recovery permits' (last updated 29 June 2023) it is not considered the site poses a significant risk of gas generation to surrounding receptors. In-waste gas monitoring infrastructure will be installed in accordance with EA guidance once the phases are complete to ensure gas is monitored post-completion.

## **2.7 Environmental Issues**

- 2.7.1 It is maintained that the proposed development will not result in significant or adverse environmental effects due to the nature of the inert wastes to be used and the scale of the operations.
- 2.7.2 The placement of restoration materials could potentially result in an increase in suspended solids within any water accumulating in the base of the void(s) in each phase, however this water will be abstracted as part of the quarrying operations and discharged via the silt pond.
- 2.7.3 In terms of surface water, the Site is located close to the River Avon and it's associated tributaries, designated a Local Wildlife Site, however these are unlikely to be significantly

adversely affected by the restoration materials or recovery activities on site due to control measures in place.

- 2.7.4 Overall, there are no groundwater or surface water issues or significant risks to these receptors, and final restoration scheme is not considered to increase surface water flow rates, or have a cumulative adverse effect on surface water drainage in the area, due to the land being restored back to agricultural land use.
- 2.7.5 The hedgerows (and a suitable standoff) will be retained during quarrying and restoration of the site, with the remaining areas returned to high-grade agricultural use in a staged approach. In addition, it will feature a larger waterbody and associated wetland within Phase 1, which will be an improved habitat for the area.
- 2.7.6 No waste recovery activities will take place within any designated/habitat areas and all recovery works and wastes accepted at the site will be subject to strict waste acceptance procedures to ensure the impact to the environment is minimal. Adequate operational procedures will be in place to ensure that there are no silt loadings discharged to nearby surface water bodies.

#### Environment Agency's Groundwater Protection Position Statement

- 2.7.7 With reference to 'The Environment Agency's approach to groundwater protection' policy document (dated February 2018, Version 1.2) the placement of inert waste materials as part of the proposed restoration activities does not pose a potential hazard/pollution risk to the environment or groundwater, as these materials will not be a source of contaminants. Therefore, control measures in addition to site management procedures to protect groundwater from possible pollution from the waste materials is not required.

## **2.8 Site Engineering**

- 2.8.1 The restoration activity will be within the void produced by the excavation of the sand and gravel reserves at the Site, in a phased manner. The recovery activity will be to complete the restoration of the site and to finish the landform to agreed levels using suitable inert restoration materials which are not likely to leach or be a source of contaminants.
- 2.8.2 Recently updated Environment Agency guidance 'Waste recovery plans and deposit for recovery permits' (last updated 29 June 2023) states:
- "If your risk assessment suggests that your activity will have an impact on groundwater or surface water, you must install an attenuation layer. You must use material of a suitable quality with an appropriate thickness and permeability to prevent pollution."*
- 2.8.3 A sidewall attenuation layer consisting of a minimum thickness of 0.5m, at a minimum hydraulic conductivity of  $1 \times 10^{-7}$  m/s, will be constructed in the phases, with no basal attenuation layer considered necessary due to the sand and gravel being quarried out to the

top of the mudstone, which will act as an impermeable barrier to the vertical migration of groundwater.

- 2.8.4 There will be no waste materials placed in water as the quarry voids will be dewatered. The base of the voids will be the Mercia Mudstone, classified as a Secondary B Aquifer, which will act as a barrier to any vertical of groundwater.

## **2.9 Leachate Generation**

- 2.9.1 Subject to following strict waste acceptance criteria (inspection of waste materials on site and rejection of non-complying materials), it is unlikely that there will be a generation of leachate as a result of wastes used for restoration and therefore little chance for pollution caused to the environment.

- 2.9.2 Recently updated Environment Agency guidance 'Waste recovery plans and deposit for recovery permits' (last updated 29 June 2023) states:

*"If your risk assessment suggests that your activity will have an impact on groundwater or surface water, you must install an attenuation layer. You must use material of a suitable quality with an appropriate thickness and permeability to prevent pollution."*

- 2.9.3 The Hydrogeological Risk Assessment (HRA) for the site concludes that there is negligible risk of possible pollution or potential impact on groundwater or surface water from using the proposed inert waste materials for infilling and restoring the site.
- 2.9.4 The void will be dewatered prior to the placement of any restoration materials such that all materials are placed within a dry environment. As indicated above, a sidewall attenuation layer comprising either site-won clay-rich material, or suitable imported inert waste, will be used to prevent lateral migration of groundwater through wastes.

## **2.10 Final landform and after use**

- 2.10.1 The overall purpose of the waste recovery operations at the Site is to achieve a final landform in accordance with the planning consent to return a larger part of the site to agricultural land after quarrying, together with a new area of ecological wetland habitat in the Phase 1 area. The agricultural land will be returned to the landowner for use in a phased manner, as quarrying and restoration are completed in stages.
- 2.10.2 Once restoration is complete, regular monitoring of ground gas concentrations will be undertaken in the aftercare period to provide environmental evidence to enable permit surrender.
- 2.10.3 In accordance with Environment Agency guidance 'Landfill and deposit for recovery: aftercare and permit surrender' (last updated 30<sup>th</sup> March 2022) it must be shown that during aftercare the operator continues to manage, maintain and monitor the site to ensure it does not cause pollution. Waste acceptance records for the wastes deposited will be kept for the recovery operation by the operator to be used as evidence during surrender.

## 3.0 PATHWAY AND RECEPTOR

### 3.1 Overview

3.1.1 The pathways and receptors of the site have been characterised from a number of sources including:

- The 'GeoIndex Onshore' map on the British Geological Survey<sup>2</sup> website;
- DEFRA Magic Maps online portal<sup>3</sup>;
- Google Earth maps, 2022;
- The Environment Agency 'Catchment Data Explorer'<sup>4</sup> website;
- Planning Statement for Wasperton Farm, Barford, Warwickshire, October 2022 v2
- Hydrogeological Impact Assessment by Hafren Water in October 2022 - report ref. 3242/HIA Version F2 (attached as Appendix 1).

### 3.2 Geology

#### Regional Geology

3.2.1 The superficial deposits in the region are associated predominantly with the River Avon and situated on lower elevations. The superficial deposits comprise Alluvium, River Terrace 1 and River Terrace 2 deposits. The Alluvium generally comprises a mixture of clay, silt, sand and gravel. The River Terrace deposits comprise sand and gravel with local lenses of silt, clay or peat. The site is indicated to be entirely underlain by the River Terrace 2 deposits, which comprises the economic mineral. Isolated glacial deposits are located on some of the high points within the area.

3.2.2 The geology is shown on Drawing 3242/HIA/05 in Appendix 1, taken from the 1:50,000-scale BGS geological map for Warwick.

3.2.3 The regional bedrock geology comprises marls and mudstones of the Mercia Mudstone Group (MMG). The thickness of this unit in the area is indicated to be up to 100 m. The MMG outcrops on the higher ground of Wasperton Hill and Watchbury Hill to the east of the site, where a number of 'skerries' have been mapped by the BGS.

#### Local Geology

3.2.4 Sixty-eight mineral investigation boreholes have been drilled at the site. Topsoil and overburden were encountered down to between 0.6 metres below ground level (mbgl) (44.18 mAOD) and 3.6 mbgl (42.41 mAOD) comprising clay, sandy clay, sandy silt or clayey silt.

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<sup>2</sup> BGS GeoIndex Onshore, 2022. Found online at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>

<sup>3</sup> DEFRA Magic Maps, 2022. Found online at: <https://magic.defra.gov.uk/MagicMap.aspx>

<sup>4</sup> Environment Agency Catchment Data Explorer 2022. Found online at: <https://environment.data.gov.uk/catchment-planning/WaterBody/GB104028064350>

- 3.2.5 Sand and gravel was encountered to between 40.60 mAOD and 42.74 mAOD, with an average thickness of 2.3 m. The upper units of the mineral deposit comprise sand with varying contents of silt, clay and gravel. Towards the base the strata predominantly comprise sand and gravel.
- 3.2.6 Sand and gravel was absent within seven mineral investigation boreholes drilled in the northeast of the site. This site-specific data differs from the boundary defined on BGS mapping, indicating that the lateral limit of the sand and gravel deposit occurs within the site boundary.
- 3.2.7 Bedrock was encountered directly beneath the sand and gravel and was recorded as either a mudstone or firm to stiff clay.

### **3.3 Topography**

- 3.3.1 To the east, the land is in arable use and rises from 45mAOD (metres above Ordnance Datum) on Site, up to 85mAOD at Wasperton Hill (OS Grid SP 29084 59516) 1,125m east of the Site.
- 3.3.2 To the south the land is generally flat farmland falling very gently to 44.5mAOD towards the Thelsford Brook. This brook lies 250m to the south of the Site.

### **3.4 Hydrology**

#### Surface Watercourses

- 3.4.1 The Site comprises a series of farm drains, with the central and southern parts draining to the Thelsford Brook to the south. The northern half of the Site drains north and west to the River Avon.
- 3.4.2 The drain (running around the northern limit of the Site) forms part of the much larger county wildlife site that includes the River Avon.
- 3.4.3 The nearest named watercourse to the Site is the River Avon, which is located 90 m west of the Site at its closest approach flowing generally south to south-westwards.
- 3.4.4 A tributary of the River Avon, Thelsford Brook, passes 170 m to the south of the Site, flowing westwards towards the River Avon.
- 3.4.5 Two field ditches originate in the north of the Site near Holloway Farm and Wasperton Farm, respectively. A surface water drainage divide exists close to the southern extent of the proposed Phase 2 extraction. North of the divide the ditches flow northwards, towards Wasperton Farm, and then west past Holloway Farm to the River Avon. To the south the ditches flow southwards and coalesce at a waterbody approximately 130 m north of Glebe Farm. From this point the water flows southwards joining Thelsford Brook 170 m south of the Site. The water level within these ditches was approximately 0.1 m to 0.2 m deep and at a similar elevation to groundwater. The flow rate within these ditches was generally so slow as to be indeterminable.

3.4.6 Field ditches are present along most of the field boundaries and convey run-off towards the larger ditches. Where waterbodies are located near field boundaries, water is conveyed into and out of the waterbodies by the perimeter ditches. Monitoring of groundwater elevations within nearby boreholes indicates that the elevation of the water within the ditches is similar to groundwater.

3.4.7 The watercourses are shown on Drawing 3242/HIA/02 in Appendix 1.

#### Surface Waterbodies

3.4.8 A small pond is located within the wooded area to the south of Holloway Farm (W1 on Drawing 3242/HIA/02). Comparison of groundwater levels and LiDAR data indicates that this is a groundwater-supported waterbody. During the site walkover the water level within this waterbody was similar to the adjacent field ditch.

3.4.9 A small pond (W2) is located north of Glebe Farm, which discharges water southwards offsite via a ditch. Water is conveyed to this waterbody via the two larger ditches and a smaller boundary ditch. Water elevations in a nearby monitoring borehole indicate that this pond is in hydraulic continuity with groundwater.

3.4.10 Ordnance Survey mapping indicates the presence of two waterbodies at Wasperton Farm (W3). The southern waterbody is incorporated into the drainage system.

3.4.11 A further two ponds located to the east (W4) and southeast (W5) of the site boundary are considered likely to have originally been surface water-fed due to their location on bedrock (low permeability Mercia Mudstone). However, field ditches pass through these waterbodies, creating a connection to groundwater.

3.4.12 A waterbody which is not shown on OS mapping (W6) is located on the eastern site boundary. This waterbody has also been connected to the adjacent field ditches.

3.4.13 Surface water may accumulate in the base of the void(s) in each phase, however this water will be abstracted as part of the quarrying operations and discharged via the silt pond. In terms of surface water, local water courses and controlled waters are unlikely to be significantly adversely affected by the restoration materials due to their inert nature.

#### Springs

3.4.14 No springs are present on OS mapping within the same surface water catchment as the Site.

#### Surface Water Abstractions

3.4.15 Records of nearby licensed water abstractions were requested from the Environment Agency by Hafren Water for the Hydrogeological Impact Assessment. Fourteen licensed surface water abstractions are located within 2 km of the site boundary. Ten of these abstractions are made from the River Avon and four from the Thelsford Brook.

- 3.4.16 The closest abstraction is located approximately 100 m west of the site boundary (Licence No 18/54/13/076). It is used for direct spray irrigation at Wasperton Hill Farm between 1st March and 31st October. The licence permits 140,000 m<sup>3</sup>/annum, and 2,000 m<sup>3</sup>/day. The next nearest abstractions are located c300 m west of the site boundary, from the River Avon, near the village of Wasperton. These abstractions are also for spray irrigation.
- 3.4.17 The locations of the abstractions are shown on Drawing 3242/HIA/02 (in Appendix 1).

### Flooding

- 3.4.18 The majority of the Site sits in Flood Zone 1 although the southern part of the Site is within Zones 2 and 3 of the Thelsford Brook floodplain (see Figure 4 below), which extends into phases 1, 7, 8 and 9 of the proposed development at the southern end of the Site.
- 3.4.19 The River Avon flood plain sits close to the western limit of the Site but the topography of the Avon valley means that the Site sits approximately 7m above the river valley flood levels.
- 3.4.20 The flood risk associated with development of the site is discussed further in the Flood Risk Assessment report ref. 3242/FRA/F1, March 2022 (in Appendix 1).



**Figure 4 – Flood Zones near to Site – Flood Zone 3 associated with Thelsford Brook**

## **3.5 Hydrogeology**

### Source Protection Zones (SPZs)

- 3.5.1 The Site is not within a Source Protection Zone (SPZ), with the closest (Zone II subsurface activity SPZ) 570m to the south.

### Aquifer Characteristics

- 3.5.2 A search on Magic Maps identified that the site is within a Secondary A Aquifer within the superficial deposits, defined as '*...permeable layers that can support local water supplies, and*

*may form an important source of base flow to rivers'*, however the majority of the sands and gravels at the site will be extracted out of the site during quarrying.

- 3.5.3 The bedrock below the Site, the Mercia Mudstone, is classified as a Secondary B Aquifer, defined as an aquifer with '*...lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers*'.

#### Groundwater Flow

- 3.5.4 Monitoring standpipes were installed within four of the mineral investigation boreholes drilled in 2019 with a further five monitoring locations installed in 2020. One borehole has been damaged. Fifteen water monitoring records exist between November 2019 and November 2021. Hydrographs of the monitoring data are presented on Drawing 3242/HIA/06 in Appendix 1. The data indicates that groundwater flow is westwards, towards the River Avon and that the groundwater and river are in hydraulic continuity. A groundwater contour plot is shown on Drawing 3242/HIA/07 (in Appendix 1) using data from November 2021.

#### Groundwater Abstractions

- 3.5.5 Severn Trent has a licensed groundwater abstraction within a 2km radius of the Site boundary and is linked to other boreholes in Wellesbourne, for public water supply. It is situated at Thelsford Corner, 80m south.
- 3.5.6 Unlicensed abstractions are those with a volume of less than 20m<sup>3</sup> per day. Data provided by Warwick District Council indicates three private water supplies within a 2km of the Site boundary.

#### Groundwater Quality

- 3.5.7 The importation of restoration soils to the site introduces the potential for an impact on groundwater quality from fuels storage and accidental spillages together with the restoration soil themselves. Waste Acceptance procedures and appropriate controls will be implemented as part of restoration activities at the application site to ensure there is no unacceptable risk to the local groundwater environment. Contaminated loads will be required to be rejected from site prior to processing and as a consequence the risk of rogue loads is considered very low. Therefore, the potential impact from the placement of restorations soils within the residual void is considered to be negligible.
- 3.5.8 Storage tanks will be suitably double-bunded or comprise integral bunded tanks. Spill kits will be kept in close proximity to the filling points in case of accidental spillages. Standard operating procedures will be employed for the refuelling and maintenance of any plant. This may comprise, for example, the use of spill trays and catch pits. As such, any operations at the site will adhere to strict management practices in relation to fuels and potential accidental spillages.

### 3.6 Man-Made Subsurface Pathways

#### Agricultural Drains

- 3.6.1 A shallow ephemeral drain runs between phases 2 and 3 before skirting the northern edge of the Site westwards towards the River Avon. This is part of a county wildlife site designation linked to the River Avon. This is often dry but in wet conditions, flows north to the edge of the Site then west towards the River.
- 3.6.2 A larger central drain flows southwards between Phase 1 and phases 8-11. This drain ultimately discharges into the Thelsford Brook to the south of the Site.

### 3.7 Meteorological Setting

- 3.7.1 The closest meteorological station to the site actively recording wind statistics is Lawford Heath/Rugby, located over 22 km northeast of the Site. Wind statistics from this weather station are considered to be representative of the typical conditions at the site (see Figure 5 below).

A review of the data recorded daily between November 2008 and June 2023 on the Windfinder.com website<sup>5</sup> indicates that the prevailing wind direction is from the southwest towards the northeast.

#### Monthly wind direction and strength distribution

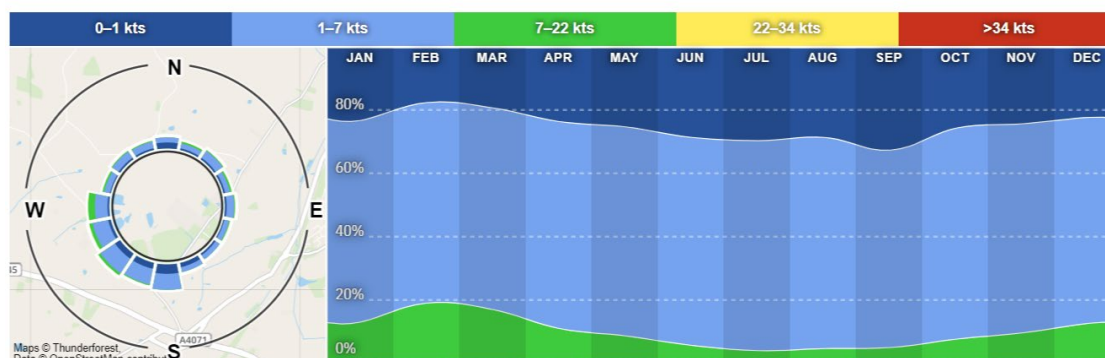


Figure 5 – Lawford Heath / Rugby wind statistics – average wind direction & strength 2008 to 2023

<sup>5</sup> Windfinder website 2023, found here: [https://www.windfinder.com/windstatistics/lawford-heath\\_rugby](https://www.windfinder.com/windstatistics/lawford-heath_rugby)



Figure 6 – The direction towards which the prevailing wind is blowing (NE) in relation to the site.

### 3.8 Receptors and Compliance Points

3.8.1 The nearest receptors that will need to be considered within the risk assessments are described below. The sensitive receptors around the site have also been considered in the Environmental Risk Assessment report ref. 5526-CAU-XX-XX-RP-V-0302.

#### Groundwater

3.8.2 Dewatering of the quarry will be undertaken during the quarrying and restoration operations. No waste will be deposited in water. Water removed from the quarry voids will be collected

in the storage lagoons for use in the sand and gravel processing and dust suppression. It is not proposed to discharge water off-site, however if this is required a discharge consent will be obtained from the relevant authority.

- 3.8.3 Due to the inert nature of the wastes to be accepted for restoration, leachate will not be generated within the restoration materials used at the site and will not impact on potential groundwater receptors.
- 3.8.4 There is little hydraulic connectivity between the superficial deposits and the bedrock. The sand and gravel is the main groundwater bearing unit and the underlying low hydraulic conductivity of the Mercia Mudstone is considered to act as the base of the aquifer, restricting downward flow of water from the waste deposit.

#### Surface Water

- 3.8.5 The surface water near to site has been identified as a receptor, however, due to the inert nature of the wastes to be accepted for restoration, leachate will not be generated within the site. Any run-off will not impact on potential surface water receptors and will be managed during the activities, with surface water potentially loaded with suspended solids sent to the silt lagoon for settling out. It is not proposed to discharge water off-site, however if this is required a discharge consent will be obtained from the relevant authority.

#### Human Amenity (Nuisance and Health Issues)

- 3.8.6 Amenity issues that may affect receptors from this type of operation are nuisance caused by dust, noise or mud deposited on roads.
- 3.8.7 The local receptors to the site (within 1km) are identified on drawing ref. 5526-CAU-XX-XX-DR-V-1801, with their direction and distance from the application site boundary tabulated in Table 1 below.
- 3.8.8 The effect of nuisance factors (fugitive emissions, odour, noise etc.) on these receptors have been risk assessed through the Environmental Risk Assessment (report ref. 5526-CAU-XX-XX-RP-V-0302). Dust was identified to be a risk from the recovery operations at the site, particularly in dry, windy conditions, therefore a Dust & Emissions Management Plan (DEMP) has been produced as part of this permit application, as document ref. 5526-CAU-XX-XX-RP-V-0304, which includes control measures to be in place at the site to minimise emissions.

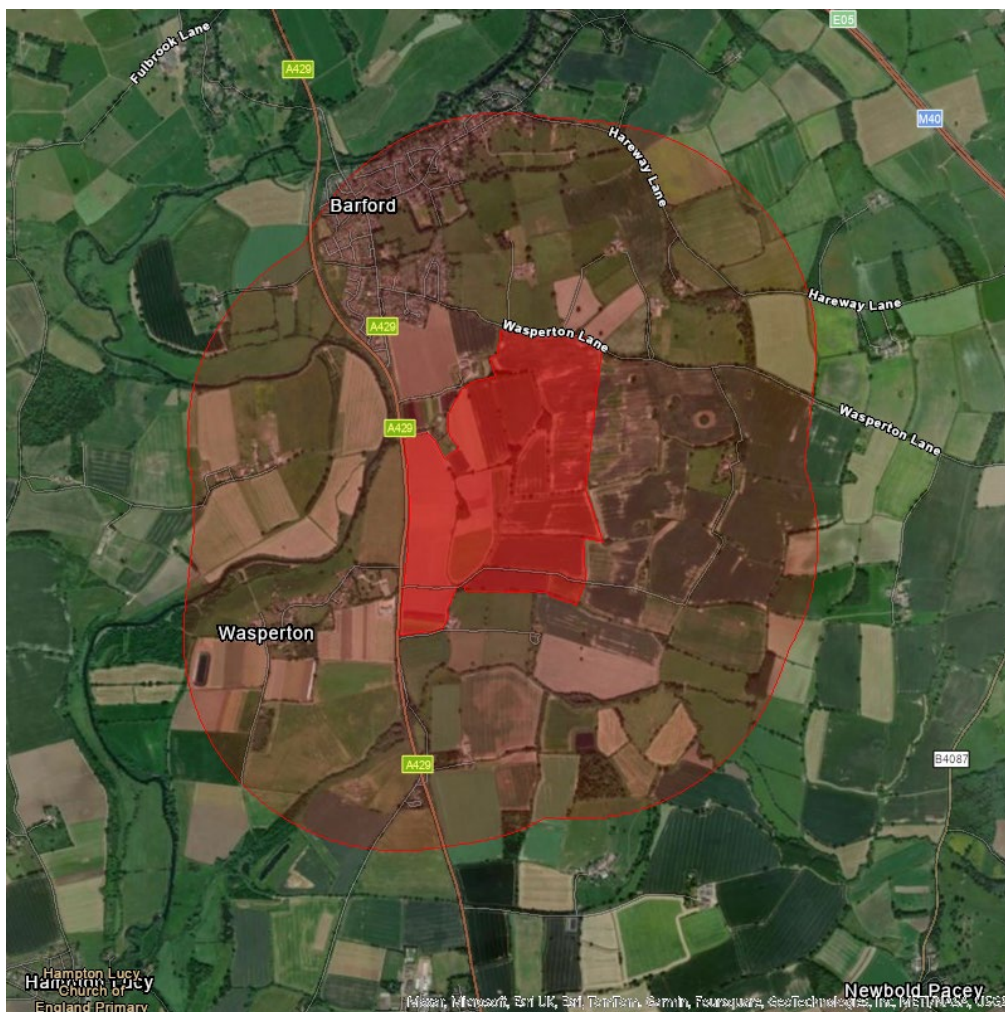
#### Designated Sites of Ecological Importance & Other Habitats

- 3.8.9 There are no statutory ecological designations within 1 km of the site boundary. The primary site of ecological importance abutting the site is the River Avon, located approximately 90 m from the western boundary, as well as tributaries located within the northern areas of the site itself. The river is designated as a Local Wildlife Site (LWS) and serves an important function as a habitat corridor.

- 3.8.10 Firtree Hill is a deciduous woodland located approximately 800m south-east of the site, and there is an area of improved grassland approximately 900 m south-west of the site boundary. The remaining ecological designations within the 1 Km radius include Wasperton Farm (arable land favoured by lapwing), St John the Baptist Churchyard (moderately species rich churchyard), Watchbury Hill (ungraded nature conservation site), and Rushy Close (broadleaved plantation of poplar), all designated as non-statutory Ecosites.
- 3.8.11 Within 2km of the site boundary, there are no Sites of Scientific Interest (SSSI), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Nature Reserves (NNRs), Ramsar sites or Areas of Outstanding Natural Beauty (AONBs). The Site is not within a Source Protection Zone (SPZ), with the closest (Zone II subsurface activity SPZ) 570m to the south. The closest Ancient Woodland designation is Hampton Wood, located 1.4km to the west.

#### Summary of Sensitive Receptors

- 3.8.12 A review of nearby sensitive receptors within 1km of the site boundary are summarised in Table 1. The 1km radius is shown on drawing ref. 4919-CAU-XX-XX-DR-V-1800 and figure 7 below:



**Figure 2 – 1km radius from the site boundary.**

**Table 1 – Sensitive Receptors within 1km of the site**

| Receptor                                                 | Receptor Type                             | Distance/Direction             |
|----------------------------------------------------------|-------------------------------------------|--------------------------------|
| River Avon                                               | Local Wildlife Site (LWS) / Surface Water | On-site and 90m W              |
| Users of footpaths/bridleways                            | Public Footpaths                          | Crossing Site on E and S, 5m S |
| Users of Wasperton Lane                                  | Public Road                               | 5m N                           |
| Holloway Farm                                            | Residential / Agricultural                | 5 m N                          |
| Glebe Farm                                               | Agricultural / Residential                | 10 m E & S                     |
| Thelsford Brook                                          | Surface Water                             | 20m SE                         |
| Wasperton Farm                                           | Residential / Agricultural                | 40m N                          |
| The Forge Cottage                                        | Residential                               | 55 m NW                        |
| Bradshaw Farm                                            | Residential                               | 60m W                          |
| Houses off Dugard Place / Wasperton Lane, Barford        | Residential                               | 160m NW, 290 m NW              |
| Seven Elms Barn (Office)                                 | Commercial                                | 180m S                         |
| Wasperton House                                          | Residential                               | 190 m SW                       |
| Middle Watchbury Farm                                    | Recreational                              | 225m N                         |
| Marl Pit Cottages                                        | Residential                               | 250m E                         |
| Houses in Wasperton Village                              | Residential                               | 270m W                         |
| Houses off Sandy Way, Barford                            | Residential                               | 325 m N                        |
| Allotments                                               | Recreational                              | 360m NW, 445m W                |
| St. John the Baptist Church                              | Recreational                              | 400m W                         |
| Houses off Wellesbourne Road / Brembridge Close, Barford | Commercial / Residential                  | 480m W                         |
| Watchbury Hill                                           | Designated non-statutory ecosite          | 500 m NE                       |
| Barford House                                            | Residential                               | 515m NW                        |
| Lower Watchbury Farm                                     | Recreational                              | 520m NE                        |
| The Green Barn House                                     | Commercial                                | 560m NE                        |
| Thelsford Farm                                           | Residential                               | 570m S                         |
| Barford School (Playing Field)                           | Residential                               | 575 m N                        |
| Firtree Hill Spinney                                     | Woodland Habitat                          | 600 m S                        |
| St.Peters Church                                         | Recreational                              | 615m N                         |
| Barford School (main building)                           | Residential                               | 670m N                         |
| Wasperton Hill                                           | Commercial                                | 670 m E                        |
| Grovefields House                                        | Residential                               | 730m W                         |
| Thelsford Cottages                                       | Residential                               | 730m S                         |
| Barford Village Centre                                   | Residential                               | 770 m NW                       |
| Rushy Close Spinney                                      | Woodland Habitat                          | 800 m SE                       |
| Woodlands House                                          | Commercial                                | 920m NE                        |

## 4.0 POLLUTION CONTROL MEASURES

### 4.1 Site: General

#### Security Infrastructure

- 4.1.1 The Site is surrounded by arable fields and public roads, with hedgerows and tree planting around the perimeters and bunds to be constructed to aid screening both visually and from noise. The site will be an active quarry and as such will benefit from site security infrastructure i.e. gates, fencing where required, lighting etc.

#### Groundwater Control or Abstraction

- 4.1.2 Dewatering of the quarry voids during mineral extraction and subsequent infilling with inert materials will be undertaken by the operator to ensure no wastes are tipped into water.

#### Surface Water Management Features

- 4.1.3 The infill and restoration of the site will be operated in a phased manner with surface water managed as part of the quarry operations. It is envisaged that several areas will be open at any one time comprising, an area of open void, an area of infilling and an area for the storage of surface water during storm events. The latter will be pumped to a silt settling lagoon prior to discharge. This operational approach and consequential landform will effectively ensure that the site operations cannot lead to an increase in overall surface water run-off from the site, thus will not increase flood risk elsewhere off site.

### 4.2 Site Engineering

#### Basal and side slope engineering

- 4.2.1 The Site is located in a Secondary A Aquifer area within the superficial deposits (sand and gravels), however the underlying bedrock is a Secondary B Aquifer.
- 4.2.2 There will be no waste materials placed in water as the quarry voids will be dewatered during mineral extraction and subsequent infilling with restoration materials. Sand and gravel mineral deposits will be extracted down to the top of the bedrock and it is considered that the Mercia Mudstone bedrock acts as an impermeable barrier to vertical migration of groundwater and as such the construction of a basal attenuation layer is not required.
- 4.2.3 An attenuation layer, as stated in Environment Agency guidance 'Waste recovery plans and deposit for recovery permits' (last updated 29 June 2023) will be constructed for the sidewalls in accordance with the conclusions of the Hydrogeological Risk Assessment (HRA) ref. 5526-CAU-XX-XX-RP-O-0305 for the site and will be a minimum of 0.5m thick and a  $1 \times 10^{-7}$  m/s permeability. The layer will be constructed in accordance with a Construction Quality Assurance (CQA) plan and will act as a low permeability layer to prevent the lateral migration

of groundwater. The sidewall attenuation layer will be engineered with an anchor trench keyed into the underlying Mercia mudstone to cut off any preferential pathways (see drawing 5526-CAU-XX-XX-DR-V-1802 for engineering details).

- 4.2.4 It is envisaged that the clay overburden present at the site will meet the requirements of the side wall attenuation layer and so this will be placed against the sides of the quarry sides. The applicant does not currently have access to the site and so are unable to undertake minerals testing on the overburden to confirm suitability and therefore, this will be undertaken prior to operations commencing at the site and will be presented as evidence supporting the CQA plan.
- 4.2.5 The site investigation into the mineral at the site indicated there will be sufficient overburden present on site to undertake the required side wall engineering, however as the operation will be undertaken in strict phases there is the possibility that there may be a shortage of material for some phases and therefore the option of suitable imported materials may be required. If imported materials are required for the attenuation layer, these will not be used prior to approval from the Environment Agency on the physical and geochemical suitability for use. Waste Acceptance Criteria for imported soils will be based on the geochemistry of the geology of the site (soils overburden) and the justification of the proposed WAC will be submitted as part of a pre-operational condition, to the EA prior to acceptance of any soils used for the attenuation layer.

#### Capping

- 4.2.6 There will be no site engineering as part of the recovery activity at the quarry. The proposed recovery activity does not fall within the requirements of the Landfill Directive and therefore no capping is proposed due to the nature of the inert wastes to be accepted. The Site will be returned to high-grade agricultural use and as such soils stripped from the site will be used as the final restoration layer.

### **4.3 Restoration**

- 4.3.1 The restoration of the Site will be undertaken in a phased manner following quarrying out of the sand and gravel mineral reserves.
- 4.3.2 Silt settling ponds will be constructed to minimise the transport of suspended solids (silt) in surface water off-site. Water collecting in the base of the void will be pumped to these silt settling ponds prior to discharge.
- 4.3.3 The inert nature of the materials to be imported onto site will pose a negligible risk of contamination to surface water and groundwater environments. The in-situ materials on-site are native to the site and therefore are not considered to pose a risk to the environment.

#### 4.4 Post-Closure Controls (Aftercare)

4.4.1 Regular maintenance of planting areas would continue for 5 years after planting in accordance with BS 7370:Part 4:1993:

- invasive weeds would be removed using an appropriate method;
- shrubs or trees which die or appear sickly, would be replaced in the autumn/winter following planting;
- regular aftercare meetings will review progress to date; and
- noxious or notifiable weeds invading the Site such as thistles (*Cirsium* spp) and Japanese Knotweed (*Fallopia japonica*) will be removed via the appropriate treatment.

4.4.2 Maintenance will be undertaken as necessary to:

- maintain planted areas weed-free during the establishment period;
- prune trees and shrubs to encourage even and healthy growth;
- prune hedges to ensure dense, stock proof hedgerows form;
- check and adjust or replace tree/shrub ties, stakes and rabbit-guards; and
- Heel-in plants suffering from frost heave.

4.4.3 Aftercare proposals for all other areas, including areas of natural regeneration, will consist of regular monitoring to identify specific maintenance requirements.

4.4.4 The timing and location of restoration works will need to be flexible as it will be governed by infilling rates. However, the general aim is to keep the infill rates as close to the sand and gravel working face as is reasonably practical.

4.4.5 Soil will be handled and replaced using the appropriate best practice guidance.

4.4.6 To deliver the restoration, detailed method statements will be issued to site contractors. Method statements will set out soil handling and storage procedure, and the locations selected for each restoration treatment. Soil stored for long periods should be seeded to prevent erosion, and soils taken from different areas of the Site should be stored separately.

4.4.7 Soil storage mounds will be managed to control weeds that may conflict with the adjacent farm uses.

4.4.8 A detailed five-year aftercare scheme would be agreed with the mineral planning authority and the tenant farmer. These may need to change from phase to phase to reflect the specific characteristics of each phase. Such aftercare scheme(s) will:

- Agree cultivation, seeding and agricultural management for 5 years;
- Ripping of any compacted areas;
- Annual soil testing and appropriate fertiliser applications;

- Monitoring of settlement on infilled areas;
- Review site drainage on restored areas and provision of mitigation where required;
- Management of hedgerows and field margins.

## 5.0 MONITORING

### 5.1 Weather

- 5.1.1 Due to the nature of the proposal it is not considered necessary to obtain regular meteorological information from a weather station or local meteorological station. Any meteorological data necessary for the review of post-closure monitoring data will be collected as part of the monitoring exercise.

### 5.2 Landfill Gas

- 5.2.1 The only waste types to be accepted at this site for use as restoration materials will be strictly inert and therefore very unlikely to produce significant quantities of gas. The main receptors likely to be sensitive to any landfill gas generation would be nearby habitats sensitive to die-back caused by ground gas and humans living and working in the nearby homes and businesses to the site.
- 5.2.2 The risk of ground gas being produced from the inert waste materials to be deposited during the recovery activities is considered to be negligible.
- 5.2.3 As per current industry guidance for deposit of inert waste on land, gas monitoring will be required in the aftercare phase, and so gas monitoring wells will be installed in the waste. The exact locations and quantities of gas monitoring boreholes will be outlined in the aftercare plan for the site. The following parameters will be monitored for:
- Methane
  - Carbon dioxide
  - Oxygen
  - Atmospheric pressure

### 5.3 Leachate

- 5.3.1 Subject to following strict waste acceptance criteria (inspection of waste materials on site and rejection of non-complying materials), it is unlikely that there will be a generation of leachate as a result of inert wastes used for restoration and therefore little chance for pollution caused to the environment.

### 5.4 Groundwater

- 5.4.1 The conceptual site model confirms that groundwater within the bedrock at the site is a sensitive receptor, being a Secondary A Aquifer within the superficial deposits. However, the risk assessments (i.e. Hydrogeological Risk Assessment) undertaken as part of this permit application considers the groundwater to not be at risk of pollution from the proposed recovery activities and waste types to be deposited, due to their inert nature not likely to contain or leach contaminants. In addition, only residual groundwater will be present beneath the site because the aquifer unit (sands and gravels) will have largely been extracted from the

site. However clay overburden will be placed against the sidewalls to form an attenuation to further protect the groundwater environment, in accordance with the recommendations provided in the HRA for the site.

- 5.4.2 Groundwater monitoring will be undertaken to provide data to ensure there is no impact from the recovery soils and to support surrender of the permit. Monitoring is proposed to be undertaken in the existing boreholes on the perimeter of the site, with an additional downgradient borehole to be installed on the west of the site. Monitoring will be undertaken prior and during the operational phase and during the aftercare phase for the site. The proposed monitoring regime is detailed within the HRA (report ref: 5526-CAU-XX-XX-RP-V-0305).

## **5.5 Surface Water Monitoring**

- 5.5.1 During the operational phases, surface water will be directed towards a silt lagoon for settling out suspended solids, prior to being stored in several other 'clean lagoons' for reuse on site as dust suppression.
- 5.5.2 The final design of the site is such that ground levels will be restored to assist with drainage and rainwater will run-off to the proposed wetland area in Phase 1 and eventually discharge to nearby field drains and tributaries of the River Avon.
- 5.5.1 It is proposed to undertake surface water monitoring as part of the aftercare phase, due to the sensitivity of the nearby River Avon and associated tributaries designated a Local Wildlife Site. Surface water locations within the nearby tributaries and ponds will be investigated prior to completion of the site to determine the appropriate locations to undertake surface water monitoring to ensure the recovery soils are not impacting on the surface water quality. The proposed monitoring scheme for surface water is detailed within the HRA report.

## **5.6 Amenity Monitoring**

- 5.6.1 The conceptual site model for the site indicates restoration activities could have the potential to cause fugitive emissions, such as dust, and other amenity nuisances such as noise, vibration and odour. These risks have been assessed in the Environmental Risk Assessment report ref. 5526-CAU-XX-XX-RP-V-0302.
- 5.6.2 A Dust & Emissions Management Plan (DEMP) has been produced as part of this permit variation application as document ref. 5526-CAU-XX-XX-RP-V-0304, to cover the proposed recovery activities. The DEMP will be included within the management system for the site.
- 5.6.3 The control measures in place at the site will ensure risks to receptors will remain low. Control measures will be regularly reviewed by site management and daily site inspections will ensure that the risk of amenity nuisances and accidents being caused by the restoration activities are kept low, as per the site environmental management system. Any incidents or complaints received will be recorded in the site diary and control measures reviewed to reduce

reoccurrence. Amenity monitoring and, where necessary, any amenity monitoring locations for the aftercare period will be outlined in the aftercare plan.

## 6.0 SITE CONDITION REPORT

### 6.1 Introduction to the Site Condition Report

#### Site Details

- 6.1.1 Site details, including information about the surrounding area of the site, are provided in Section 1 of this report.

#### Outline of proposed development

- 6.1.2 Details of the proposed development is included in Section 2.2 and 2.3 of this report.

#### Any former land-uses that may give rise to potential source of non-waste related contamination

- 6.1.3 Former land-uses that may give rise to potential sources of pollution are presented under the 'Development and Planning History' in Section 2.1 of this report. The site has predominantly been used for agriculture.
- 6.1.4 Potential contaminants arising from the proposed activities will relate to the recovery materials to be deposited, which are to be inert materials and will not pose a risk to the environment, as described in Section 2.2. The acceptance criteria for the inert materials will dictate the contaminant source, and strict waste acceptance procedures will be in place to ensure only inert wastes are deposited and contaminated wastes are rejected.

#### Sources of Information

- 6.1.5 Sources of information which have been reviewed for data on the pollution sources and receptors around the site include:
- The 'GeoIndex Onshore' map on the British Geological Survey website;
  - DEFRA Magic Maps online portal;
  - Google Earth maps, 2023;
  - The Environment Agency 'Catchment Data Explorer' website;
  - Warwick District and Warwickshire County Council online planning records;
  - Documents submitted as part of the most recent planning application.

#### Geology and Hydrogeology

- 6.1.6 The geology, hydrology and hydrogeology of the area of the site are described in detail in Sections 3.2, 3.4 and 3.5 of this report.

#### Archive search and land-use chronology

6.1.7 See Section 2.1 of this report.

Relevant information relating to potential contaminants

6.1.8 See Section 2.1 of this report.

Any history of incidents

6.1.9 Any information relating to the historical development and incidents are detailed in Section 2.1 of this report.

Objectives of Site Condition Report and Context with EPR Regime

6.1.10 The Environmental Permitting Regulations (EPR) 2016 require that a permit application is accompanied by a Site Condition Report (SCR), which describes the condition of the whole site, not just the area where the recovery activities are taking place. In particular, operators are required to “identify any substances in, on or under land which may constitute a pollution risk”.

6.1.11 This section attempts to provide a factual “baseline” account of the land that may later be compared against the findings of the Completion Report or the results of other investigations. It allows contaminants that were present on the site prior to the issue of the permit to be distinguished from those that occurred as a result of activities undertaken under the permit. The majority of this information is presented in Sections 1, 2 and 3 of this report.

Description of General Approach

6.1.12 This Site Condition Report provides the details on the condition of the land at the time prior to varying the recovery permit, with reference to different types of contaminants to be considered and data collected from any site investigations, laboratory analysis or site visits/surveys, to build an overall picture of the condition of the land prior to amendment of the Environmental Permit. The limitations or constraints of the findings is also discussed and a concluding proposal of baseline conditions for the site presented.

Different types of contaminants to be considered

6.1.13 The possible sources of historical contamination may be from leaks and spills of oils and fuels from plant, vehicles and machinery used at the site during quarrying activities prior to restoration activities, however these will be small in size and not considered a significant risk to the environment. No other potential contaminant sources have been identified.

Description of site investigation and related work activities

6.1.14 A site investigation has not been considered necessary as part of this permit variation application to establish baseline soil conditions.

- 6.1.15 The whole site has been drilled down to the underlying clays (over 60 boreholes) as part of a Geological Site Investigation into the mineral reserves by Greenfields Environmental Ltd in 2019, but no evidence of anything but the natural ground has been encountered across the whole site. This has included the installation of piezometers to monitor the groundwater.
- 6.1.16 The site has been in use as agricultural land for many decades. The operator has confirmed there are no records of any pollution incidents, leaks or spills of hazardous substances in the area, or any visual evidence of contamination in the ground.

## **6.2 Conclusions**

- 6.2.1 In consideration of the findings of this Site Condition Report, it has been concluded that the environmental information included provides for a good estimate of baseline conditions at the site.
- 6.2.2 This report should be used in the future to demonstrate that land and groundwater has been protected during the lifetime of the site and, after a suitable aftercare period, that the land is in a satisfactory state to enable surrender of the Environmental Permit.

## 7.0 REFERENCES

- Environment Agency, published 30<sup>th</sup> January 2020 (last updated 29 June 2023) guidance: 'Landfill operators: environmental permits - What to include in your environmental setting and site design report', found at: <https://www.gov.uk/guidance/landfill-operators-environmental-permits/what-to-include-in-your-environmental-setting-and-site-design-report>
- The Environmental Permitting (England and Wales) Regulations 2016. Found at: [www.legislation.gov.uk](http://www.legislation.gov.uk)
- Environment Agency, 2018 guidance 'The Environment Agency's approach to groundwater protection', Version 1.2, dated February 2018, found at: <https://www.gov.uk/government/publications/groundwater-protection-position-statements>

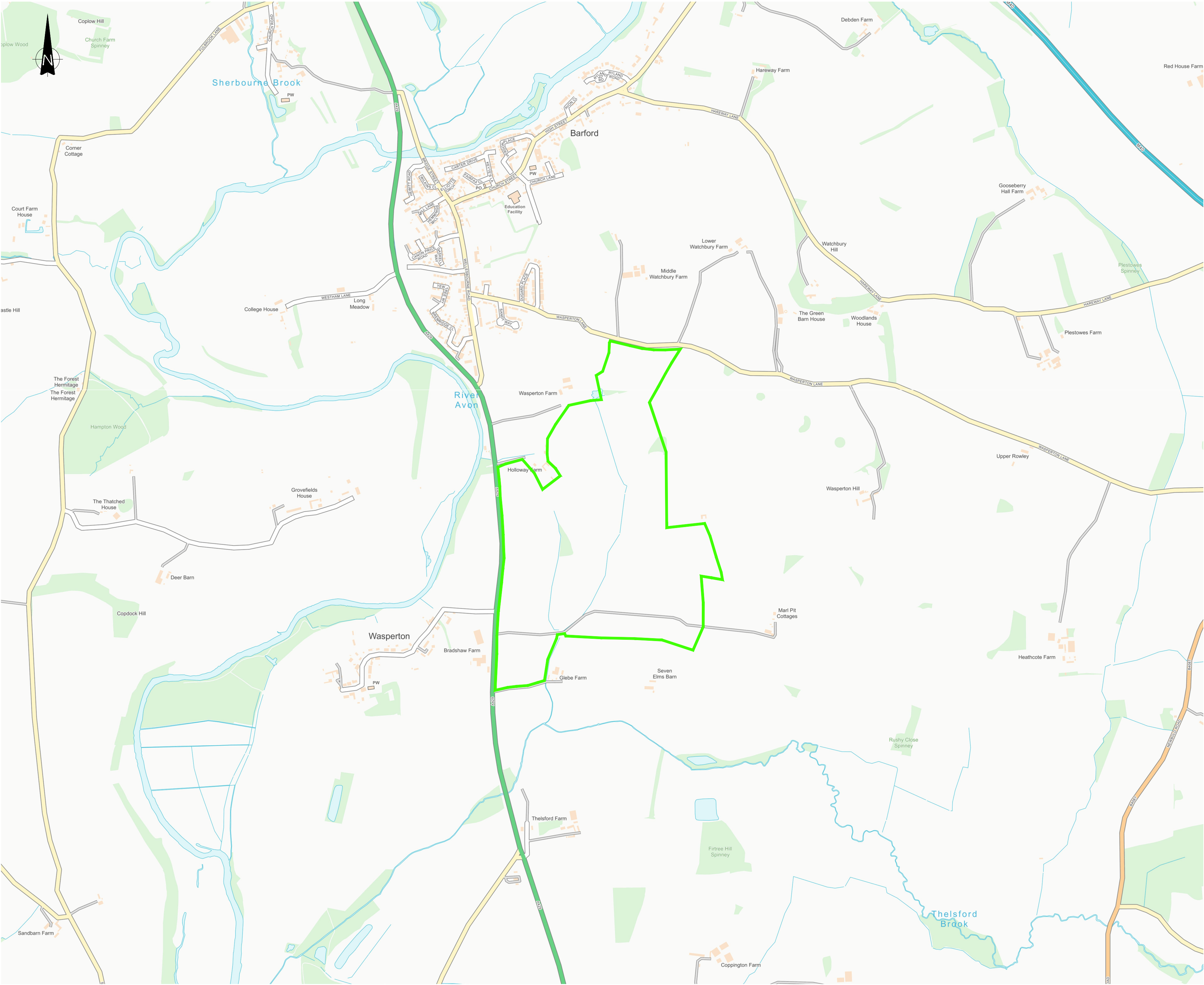
## DRAWINGS

LD135-WSP-005d Final Restoration Phases 1-12 Restored

LD135-WSP-024 Planning Application & Landholding Plan

5526-CAU-XX-XX-DR-V-1800 Permit Boundary Plan

5526-CAU-XX-XX-DR-V-1801 Sensitive Receptor Plan



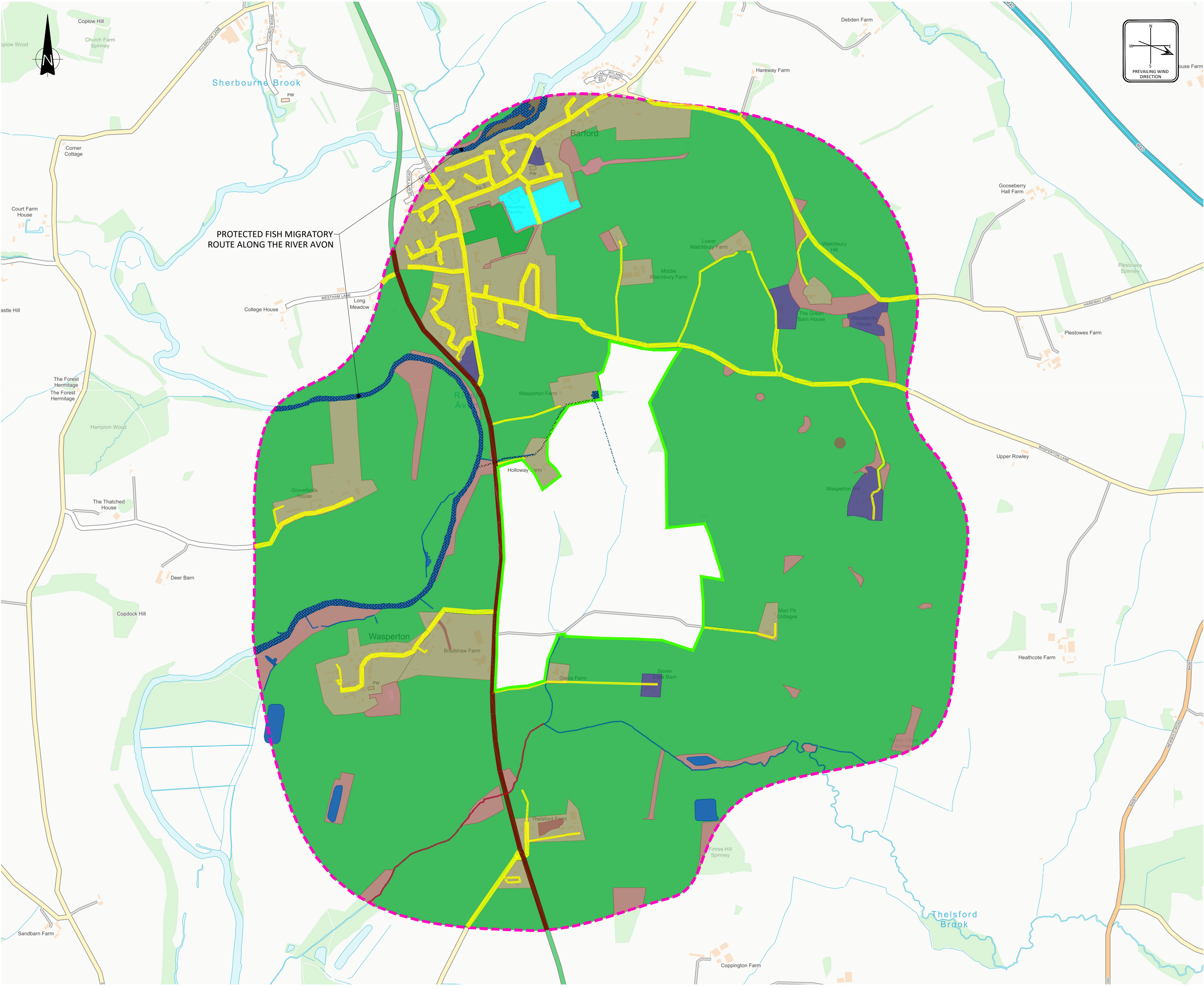
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PERMIT BOUNDARY

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| WASPERTON FARM QUARRY                                             |                        |             |               |    |          |
| TITLE:                                                            |                        |             |               |    |          |
| PERMIT BOUNDARY PLAN                                              |                        |             |               |    |          |
| DESIGNED BY                                                       | DRAWN BY               | REVIEWED BY | AUTHORISED BY |    |          |
| EJD                                                               | EJD                    | SH          | SH            |    |          |
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LEGEND

PERMIT BOUNDARY

1000m OFFSET

SURFACE WATER

WOODLAND / SCRUBLAND

COMMERCIAL

EDUCATIONAL FACILITY

INDUSTRIAL

RESIDENTIAL

MAJOR ROAD

MINOR ROAD

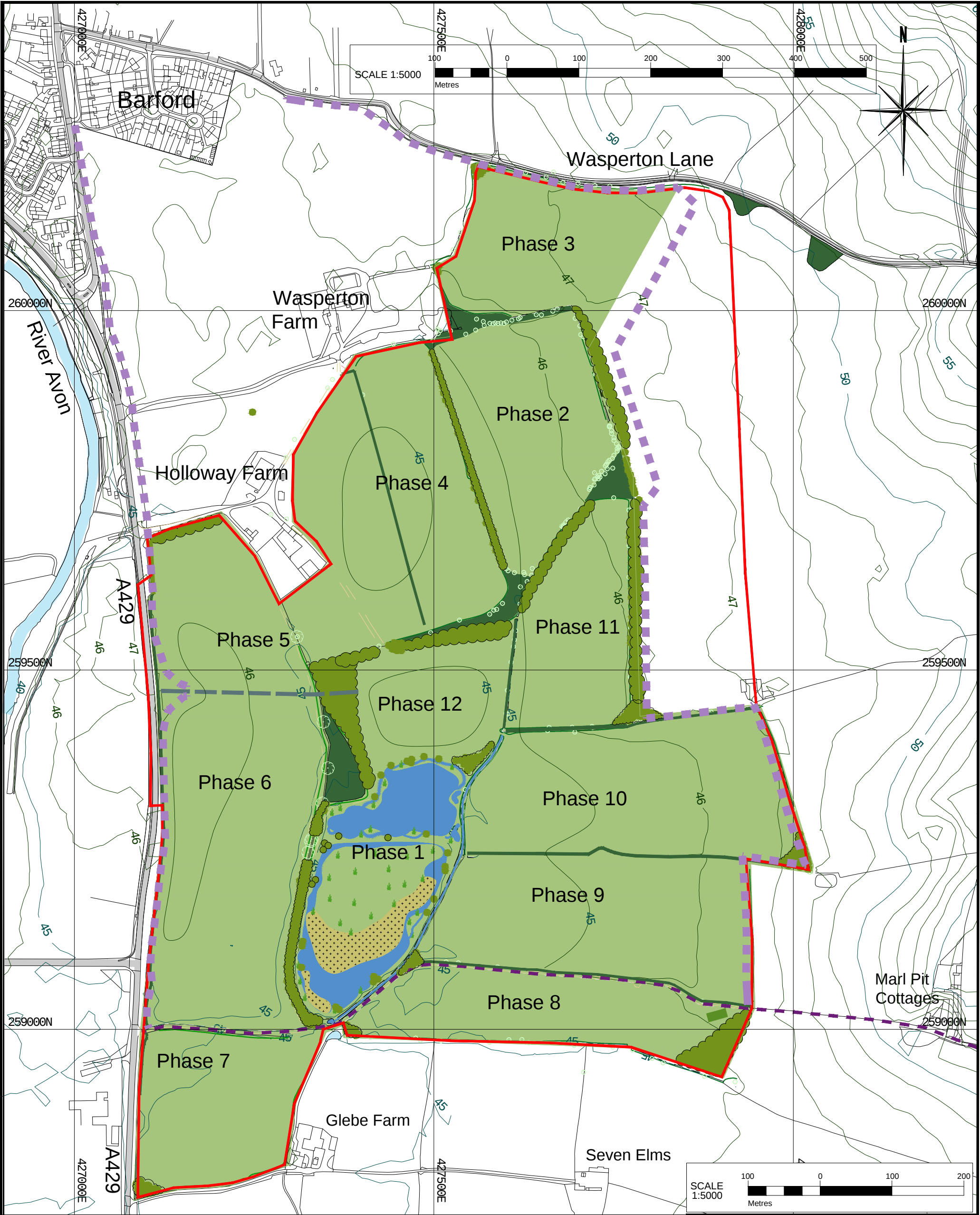
RAIL

LOCAL WILDLIFE SITES

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| WASPERTON FARM QUARRY                                      |  |                        |  |             |    |               |          |
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| SENSITIVE RECEPTORS PLAN                                   |  |                        |  |             |    |               |          |
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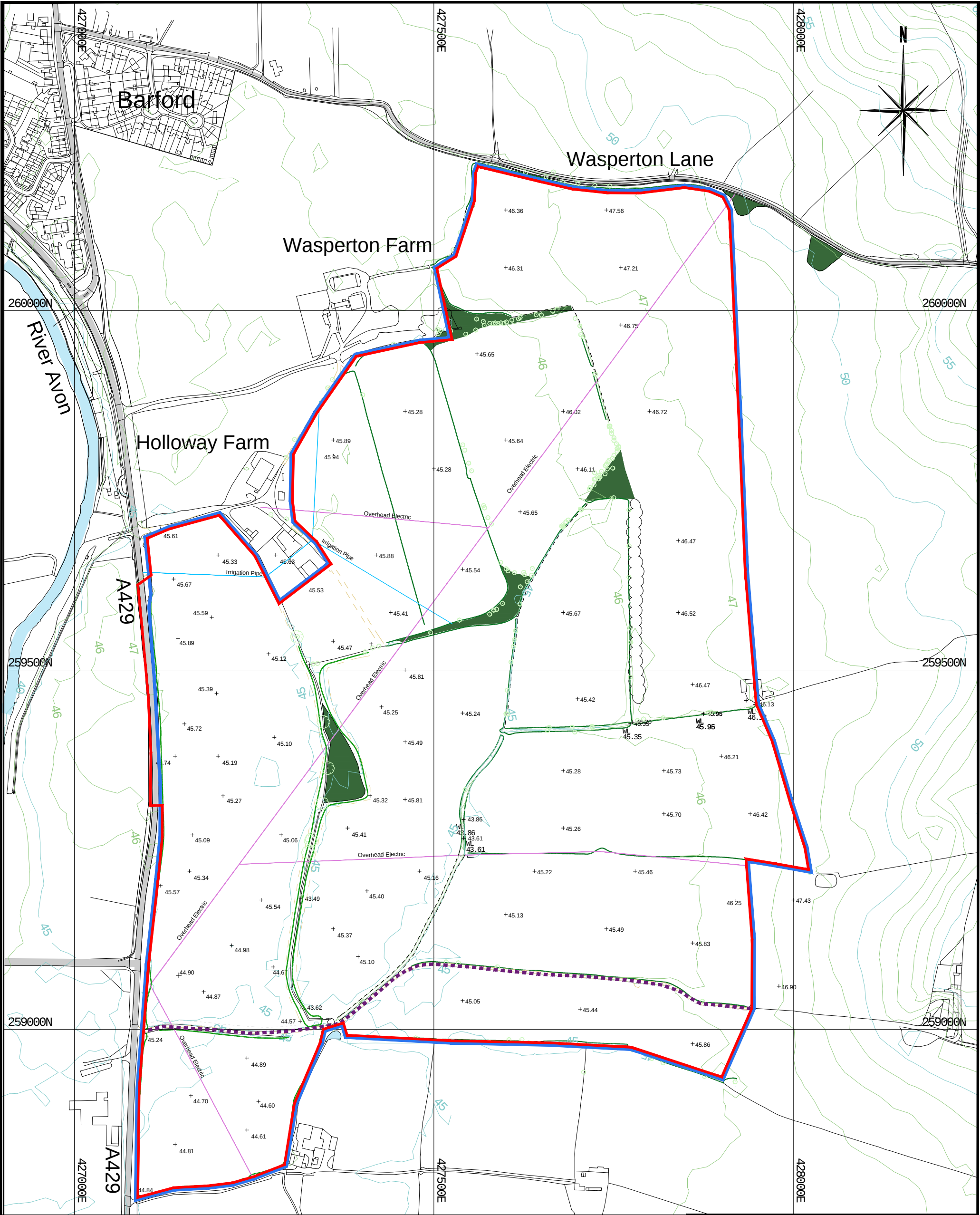
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- Planning application area
- Agricultural restoration
- Existing trees
- Proposed trees
- Permissive bridleway

- Open water/ reeds
- Marshy grassland/scrub
- Access road
- Bridleway

Note: Planting details to be found in Landscape section of the ES

|                                                            |                   |                                |
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| Site<br><b>Wasperton</b>                                   |                   |                                |
| Title<br><b>Final restoration<br/>Phases 1-12 restored</b> |                   |                                |
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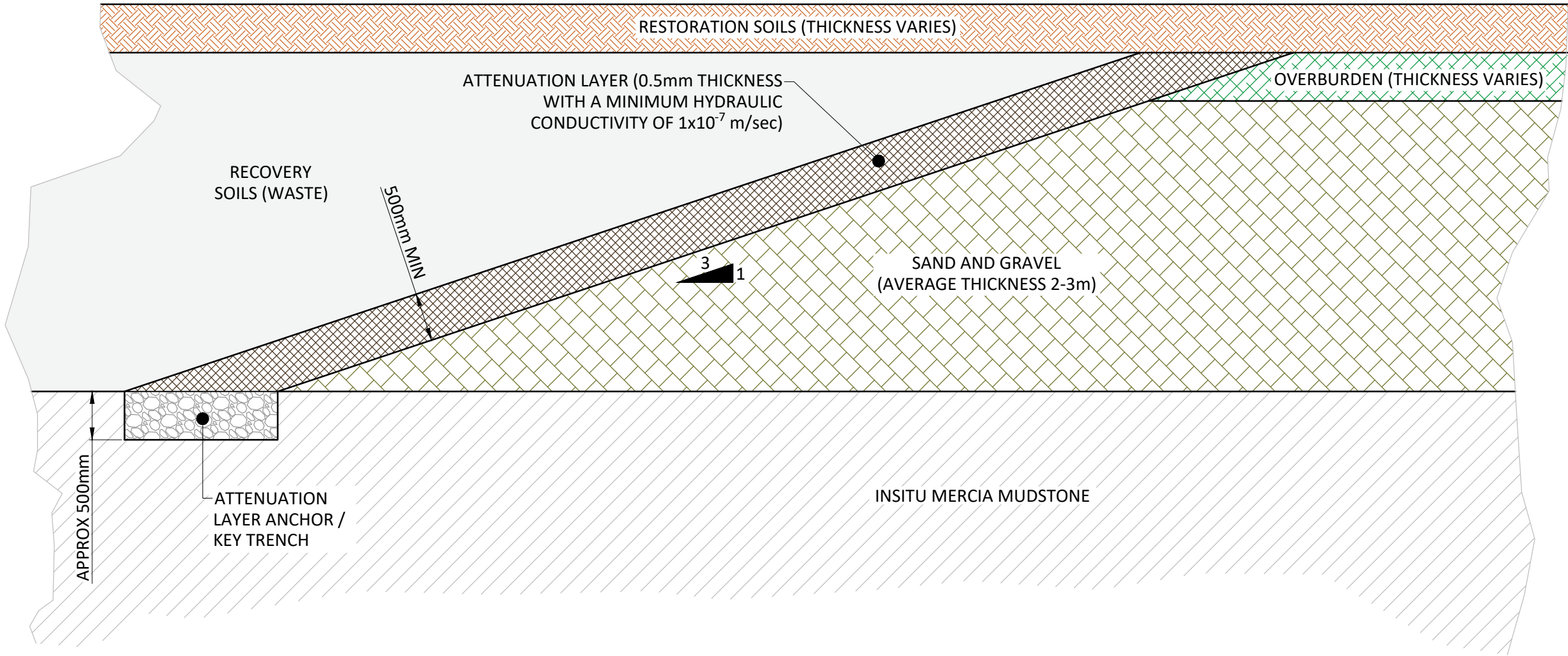
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-  Planning application area



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| Scale at A3                                             | Date       | Drawing No.   |
| 1:5000                                                  | Sept 2022  | LD135-WSP-024 |
| Drawn By                                                | Checked By |               |
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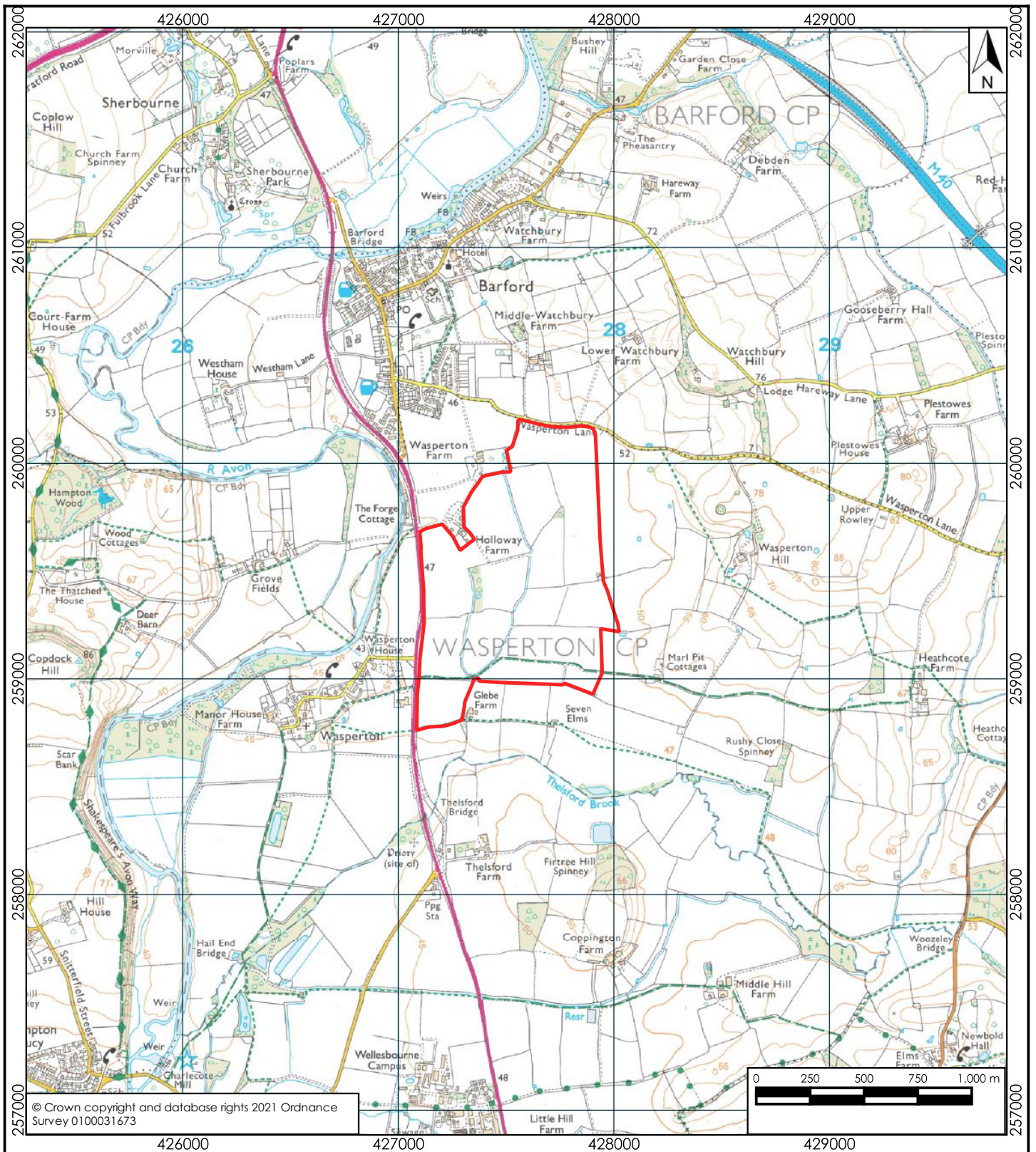
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1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

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| WASPERTON FARM QUARRY                                                     |                        |            |    |             |          |
| TITLE:                                                                    |                        |            |    |             |          |
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| JC                                                                        |                        | EJD        |    | AD          |          |
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## **APPENDIX 1**

**Hafren Water Hydrogeological Impact Assessment  
ref. 3242/HIA Version F2**



### Legend

Site boundary

Scale correct at A4

**hafrenwater**   
environmental water management

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Shropshire • SY1 1SB  
www.hafrenwater.com • Tel. 01743 355 770

Client Smiths Concrete Ltd  
Southam Road  
Banbury  
Oxfordshire  
OX16 2RR

Title Site Location

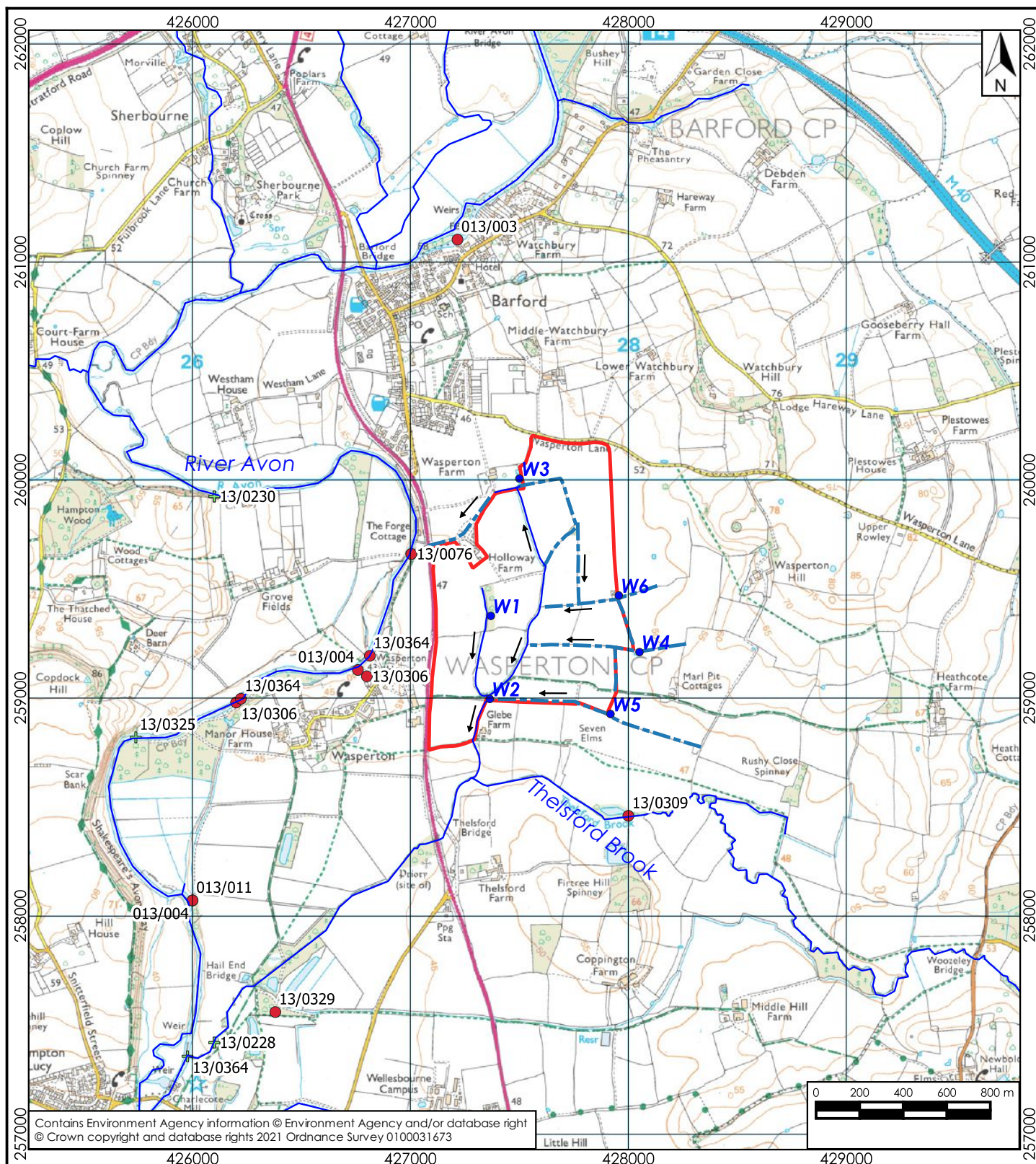
Project Wasperton

Drawing 3242/HIA/01

Version 1

Date Mar 22

Scale 1:25,000



### Legend

- Site boundary
- On-site small field ditch
- Pond
- Surface water abstraction
- Watercourse
- Single point
- Surface water flow direction
- + Reach

Scale correct at A4

**hafrenwater**   
environmental water management

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Client  
Smiths Concrete Ltd  
Southam Road  
Banbury  
Oxfordshire  
OX16 2RR

Title  
Surface water features

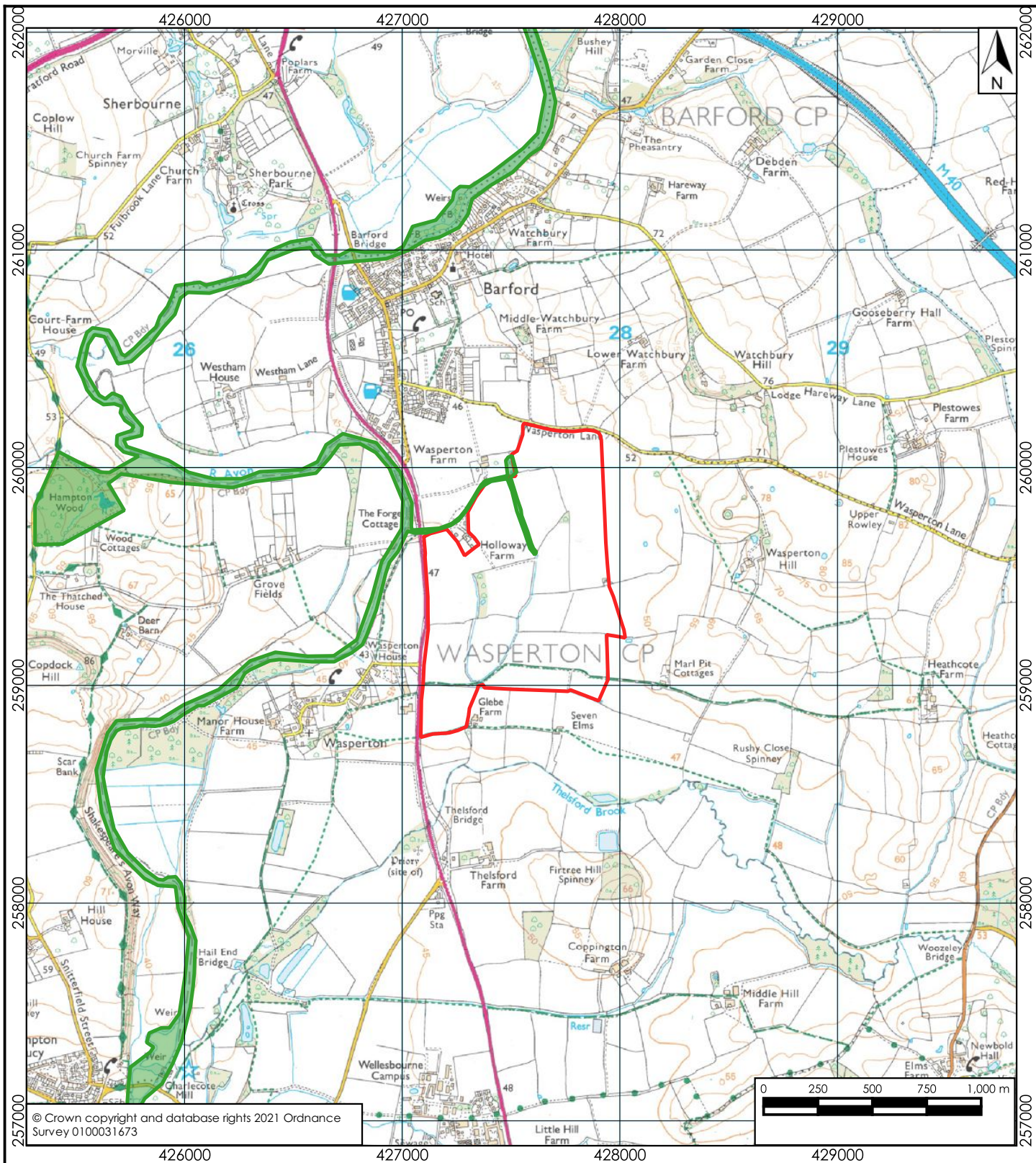
Project  
Wasperton

Drawing  
3242/HIA/02

Version  
1

Date  
Mar 22

Scale  
1:25,000



### Legend

- Site boundary
- Local Wildlife Site

Scale correct at A4

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Client **Smiths Concrete Ltd**  
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Oxfordshire  
OX16 2RR

Title **Ecological Sites**

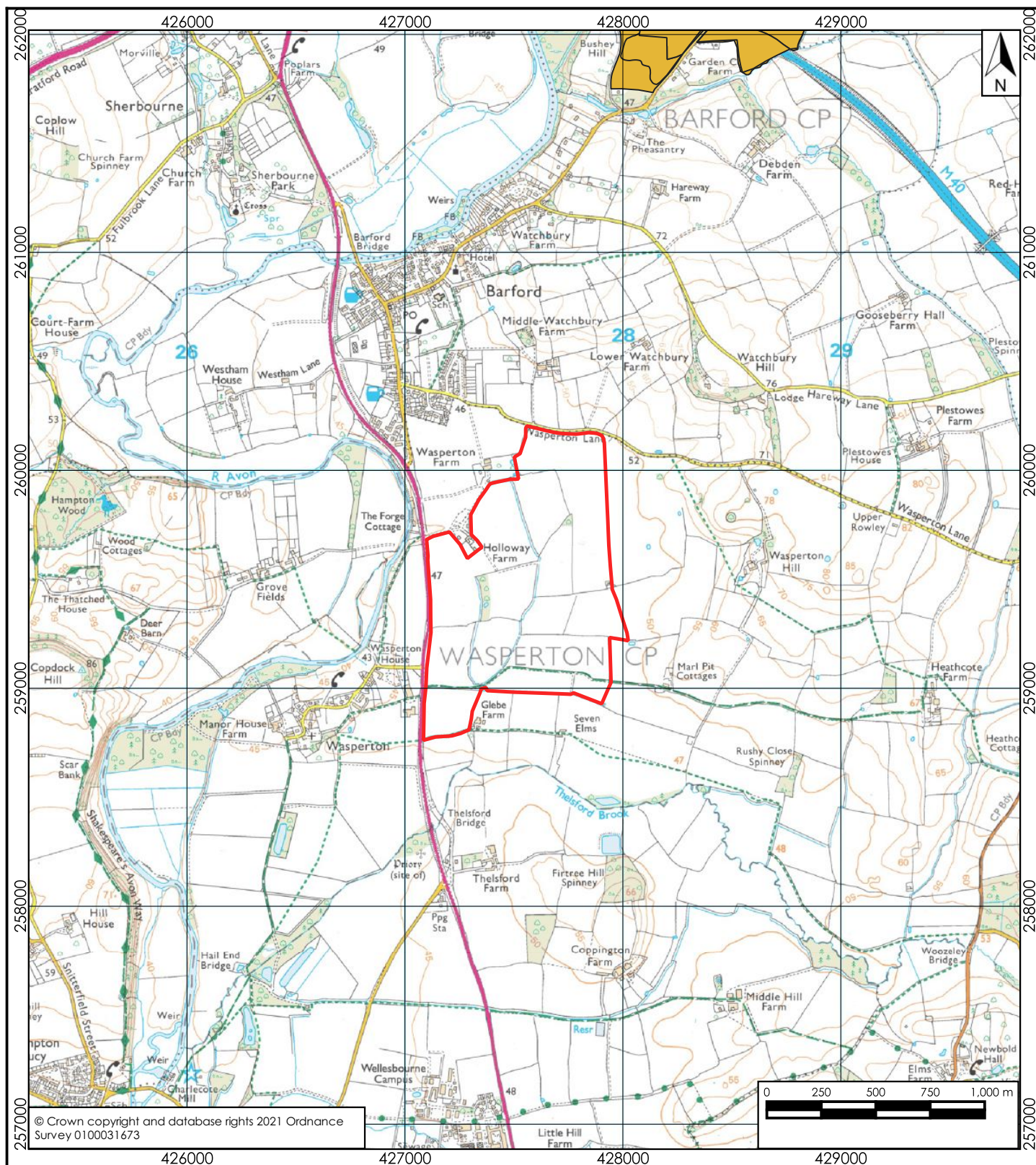
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Drawing **3242/HIA/03**

Version **1**

Date **Mar 22**

Scale **1:25,000**



### Legend

- Site boundary
- Historic Landfill

Scale correct at A4

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Client **Smiths Concrete Ltd**  
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Banbury  
Oxfordshire  
OX16 2RR

Title **Landfill Sites**

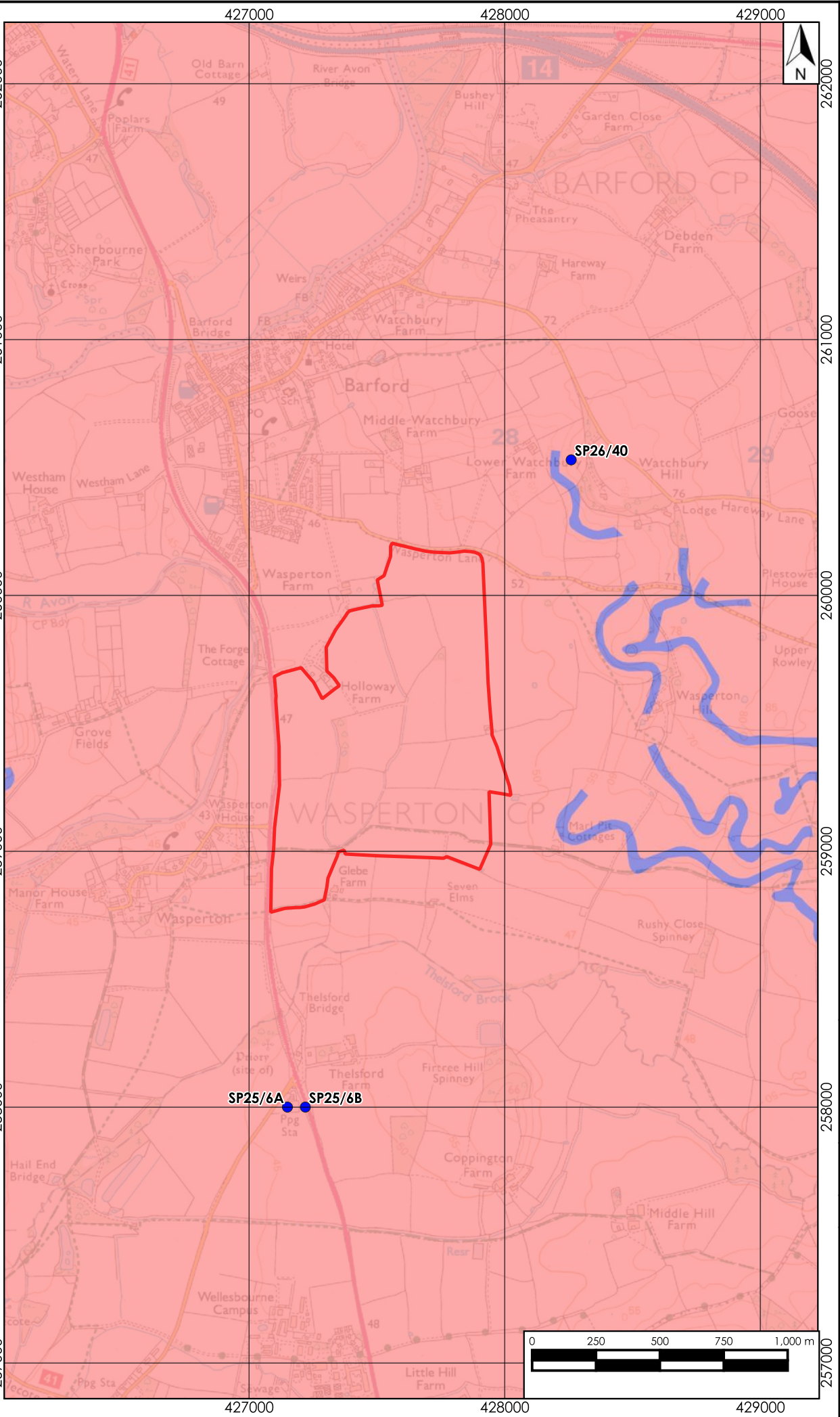
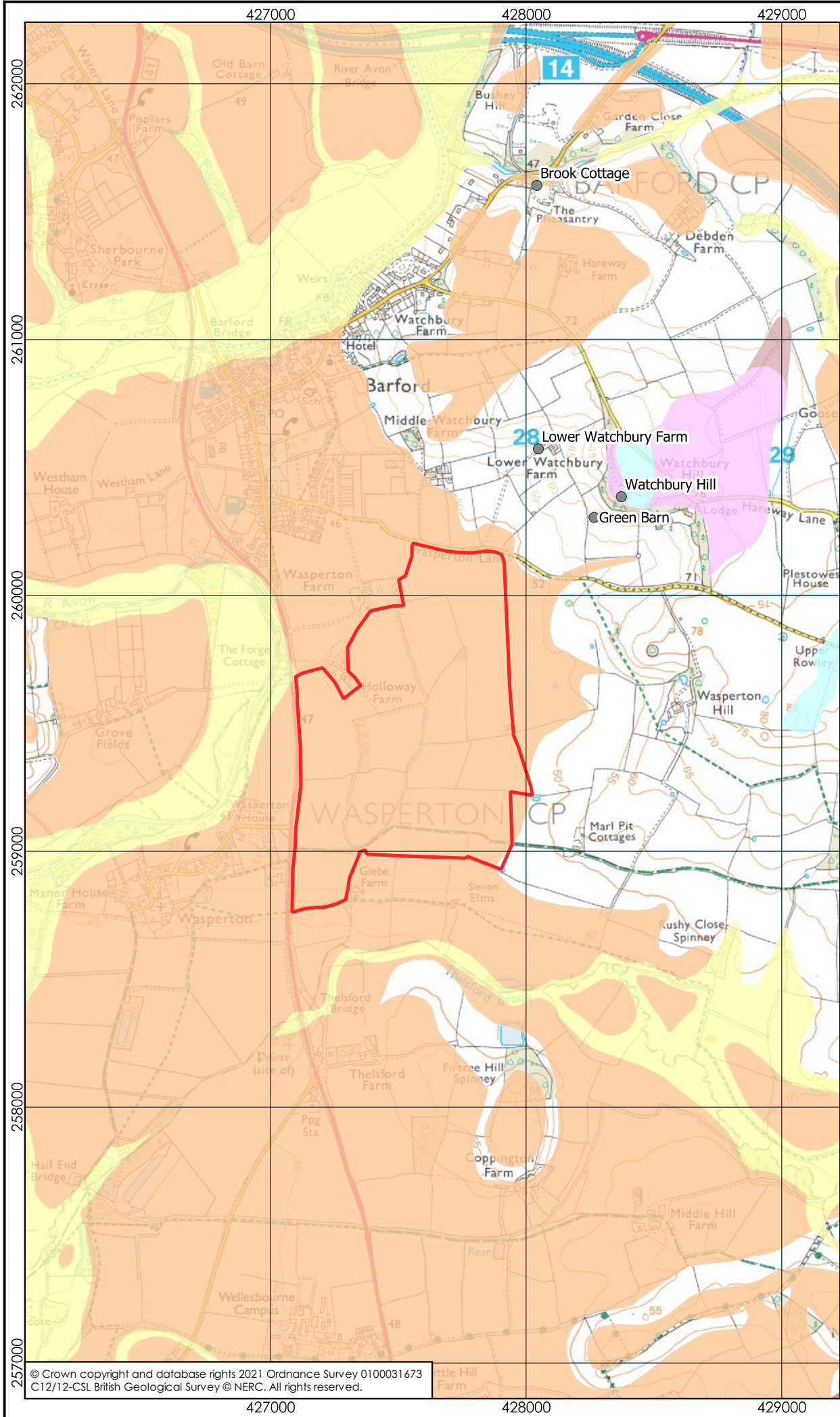
Project **Wasperton**

Drawing **3242/HIA/04**

Date **Mar 22**

Version **1**

Scale **1:25,000**



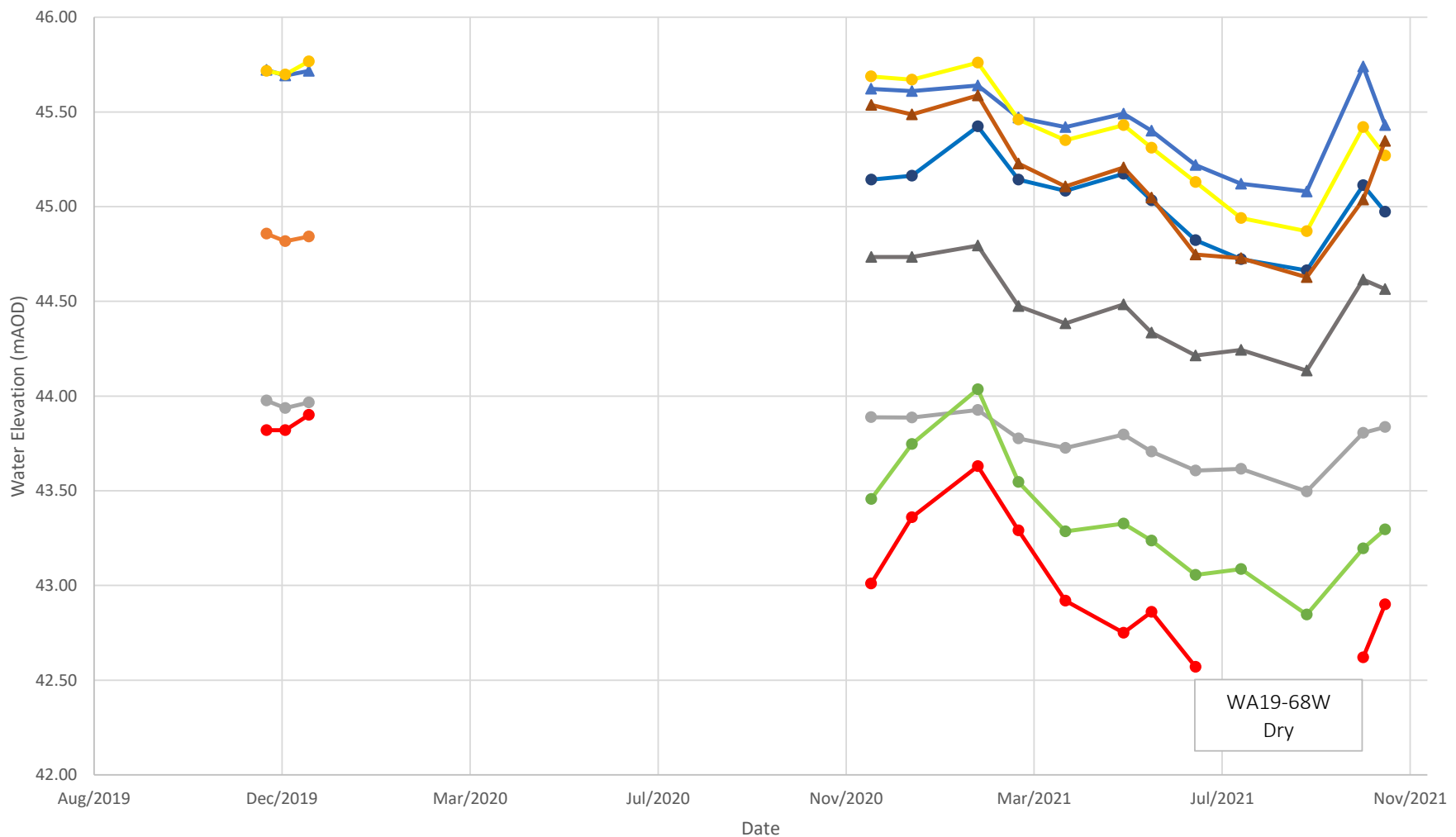
- Legend
- Site boundary
  - Licenced Borehole Abstraction
  - Private Water Abstraction
- Bedrock Geology
- Mercia Mudstone Group
  - Mercia Mudstone Group (Dolomitic Siltstone)
- Superficial Bedrock
- Alluvium
  - River Terrace Deposits
  - Head
  - Thrussington Member
  - Baginton Sand and Gravel Formation

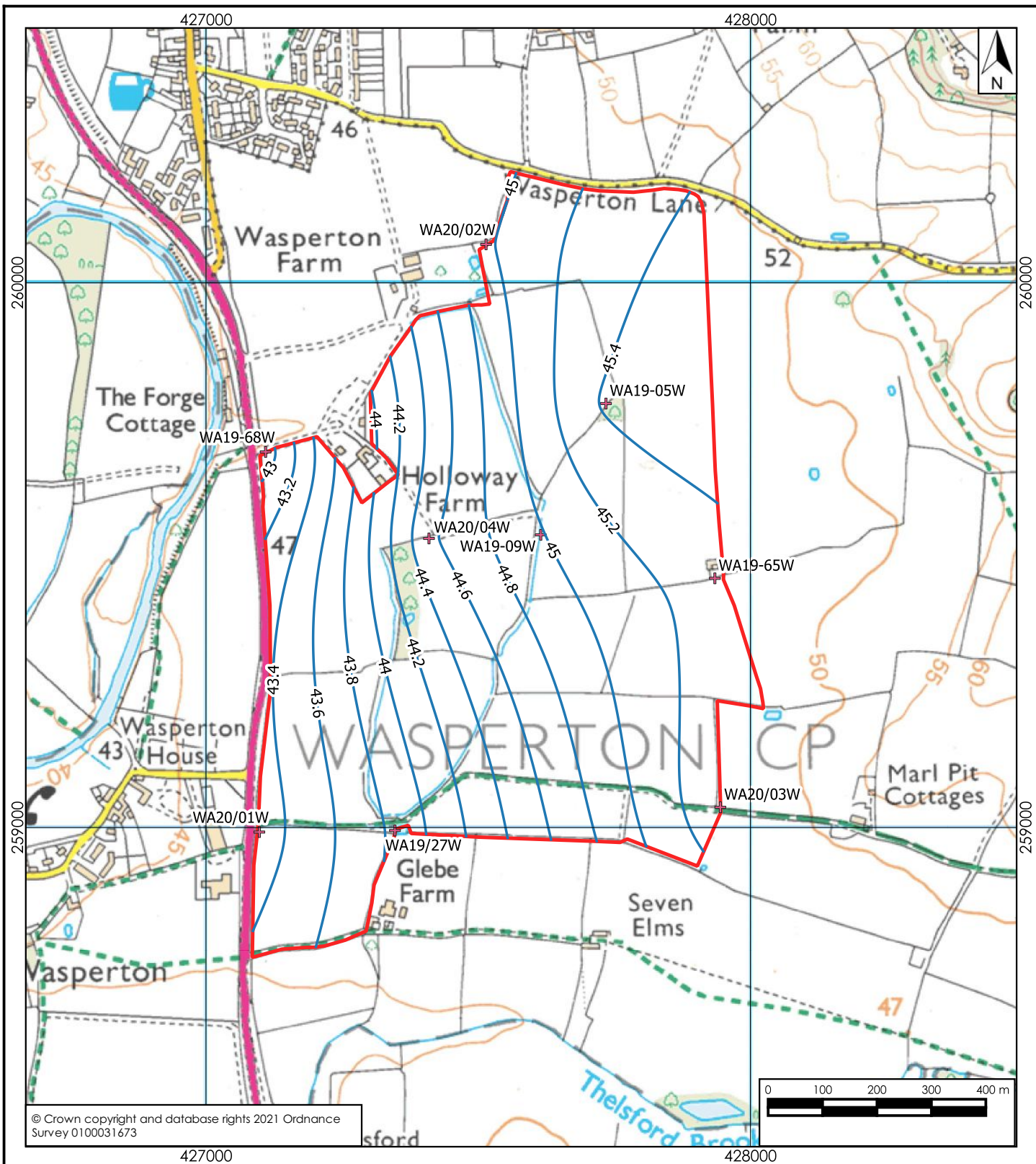
Scale correct at A3

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|---------|---------------------------------------------------------------------------|---------|----------|
| Client  | Smiths Concrete Ltd<br>Southam Road<br>Banbury<br>Oxfordshire<br>OX16 2RR |         |          |
| Title   | Superficial & Bedrock<br>Geology                                          |         |          |
| Project | Wasperton                                                                 |         |          |
| Drawing | 3242/HIA/05                                                               | Version | 1        |
| Date    | Mar 22                                                                    | Scale   | 1:20,000 |

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#### Legend

- Site boundary
- Groundwater Contours Nov 21 (m AOD)
- + Monitoring borehole

Scale correct at A4

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Title Groundwater Contours

Project Wasperton

Drawing 3242/HIA/07

Version 1

Date Mar 22

Scale 1:10,000

**HYDROGEOLOGICAL AND  
HYDROLOGICAL ASSESSMENT FOR A  
PROPOSED SAND AND GRAVEL QUARRY  
AT WASPERTON, WARWICKSHIRE**

**Report Reference: 3242/HIA  
Version F2  
October 2022**

**Report prepared for:**

Smiths Concrete Ltd  
Southam Road  
BANBURY  
Oxfordshire  
OX16 2RR

## GENERAL NOTES

Title of report: Hydrogeological Impact Assessment

Site: Wasperton

Report ref: 3242/HIA

Date: October 2022

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|----------|---------------|-----------------------|
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|          |               |                       |

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## 1 INTRODUCTION

### 1.1 Background

The proposed mineral extraction site at Wasperton, Warwickshire ('the site') comprises agricultural land extending to approximately 89 hectares (ha). It is located adjacent to the River Avon. It is proposed to extract sand and gravel down to bedrock, which will yield approximately 1 million tonnes of mineral. The restoration of the site will involve the importation of inert material to enable the return of the area to agricultural use.

Hafren Water has been commissioned to undertake an assessment of the extant water environment, including the potential for impact of the proposed development.

### 1.2 Location

The site is located approximately 5.5 km south of Warwick, centred on National Grid Reference (NGR) SP 27558 59426. The village of Wasperton is located 400 m west of the site and Barford is approximately 970 m to its north-northwest. The site location is shown on *Drawing 3242/HIA/01*.

### 1.3 Scope of assessment

The objectives of the investigation are as below:

- Determination of baseline conditions of the water environment at the site and its environs
- Identification of potential impacts of the proposed mineral extraction and restoration
- Assessment of the magnitude and significance of potential impacts of mineral extraction and the proposed subsequent restoration
- Derivation of appropriate mitigation measures for any identified potential impacts

### 1.4 Data sources

The characteristics of the water environment have been investigated with the use of existing published data and reports, assessment of site data, and experience of other sites in broadly similar settings. The data sources used in the investigation are:

Ordnance Survey (OS) mapping

- 1:25,000 scale

#### Greenfield Environmental

- A Geological Investigation & Mineral Reserves Assessment of Land at Holloway & Wasperton Farms, Nr Barford, Warwickshire, January 2020

#### Environment Agency

- Licensed surface water and groundwater abstractions

#### Warwick District Council

- Private surface water abstractions

#### British Geological Survey (BGS)

- Geological map, 1:50,000 (England & Wales), Sheet 184, Warwick, Bedrock and Superficial Edition
- GeolIndex ([www.bgs.ac.uk/geoindex/](http://www.bgs.ac.uk/geoindex/))

### **1.5 Methodology**

Baseline conditions of the water environment have been defined by the collation and analysis of existing data and field observations. The potential effects of the proposed development upon the extant water environment have been assessed by reference to the baseline data and a series of matrices (*Appendix 3242/HIA/A1*). The latter were applied to ensure a rigorous and consistent approach to the assessment of potential impacts. Mitigation measures have been proposed, where appropriate.

## 2 BASELINE CONDITIONS

### 2.1 Introduction

A review of the data sources presented in on-line databases and previous reports has been used to define the baseline conditions, which are described below.

### 2.2 Site description

The site predominantly comprises agricultural land divided by vegetated field boundaries. Three small, wooded areas exist within the site. Wasperton Farm and Holloway Farm lie on the northwestern boundary, with Glebe Farm and a residential property (Seven Elms) located on the southern.

The western boundary of the site is defined by the A429 and to the south and east by agricultural land. The northern boundary is marked by a minor road leading east from Barford Village.

The site is located within an area of relatively level topography to the east of the River Avon. Ground levels rise generally eastwards, from approximately 45 m in the west to c47 m in the east. To the east of the site, ground levels rise to 85 metres Above Ordnance Datum (mAOD) at Watchbury Hill (c710 m northeast) and 83 mAOD at Wasperton Hill (1 km east).

### 2.3 Hydrology

#### 2.3.1 Rainfall

Rainfall data were obtained from the Environment Agency for the Wellesbourne rain gauge, which is located c2.5 km to the southwest of the site (NGR SP 27095 56470). Data from between 14<sup>th</sup> July 1981 and 15<sup>th</sup> February 2021 were available. The average monthly rainfall in the recording period is shown in *Table 3242/HIA/T1*.

| 3242/HIA/T1: Rainfall data from the Wellesbourne rain gauge |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                                                             | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
| Rainfall (mm)                                               | 50.8 | 37.3 | 38.5 | 43.1 | 52.0 | 50.9 | 53.9 | 53.5 | 45.2 | 58.9 | 54.5 | 52.5 |

During the same period the total annual rainfall varied between 486 mm (2005) and 881 mm (2008), with a mean of 543 mm.

### 2.3.2 Watercourses

The nearest named watercourse to the site is the River Avon, which is located c100 m west of the site at its closest approach. The river flows generally south to southwestwards.

A tributary of the River Avon, Thelsford Brook, passes 170 m to the south of the site, flowing westwards towards the River Avon.

Two field ditches originate in the north of the site near Holloway Farm and Wasperton Farm, respectively. A surface water drainage divide exists close to the southern extent of the proposed Phase 2 extraction. North of the divide the ditches flow northwards, towards Wasperton Farm, and then west past Holloway Farm to the River Avon. To the south the ditches flow southwards and coalesce at a waterbody (W2, Section 2.3.3) approximately 130 m north of Glebe Farm. From this point the water flows southwards joining Thelsford Brook 170 m south of the site. At the time of the site walkover (16<sup>th</sup> February 2022) the water level within these ditches was approximately 0.1 m to 0.2 m deep and at a similar elevation to groundwater. The flow rate within these ditches was generally so slow as to be indeterminable.

Field ditches are present along most of the field boundaries and convey run-off towards the larger ditches. Where waterbodies are located near field boundaries, water is conveyed into and out of the waterbodies by the perimeter ditches (Section 2.3.3). Monitoring of groundwater elevations within nearby boreholes (Section 2.7.2) indicates that the elevation of the water within the ditches is similar to groundwater.

The watercourses are shown on *Drawing 3242/HIA/02*.

### 2.3.3 Waterbodies

A small pond is located within the wooded area to the south of Holloway Farm (W1 on *Drawing 3242/HIA/02*). Comparison of groundwater levels and LiDAR data indicates that this is a groundwater-supported waterbody. During the site walkover the water level within this waterbody was similar to the adjacent field ditch.

A small pond (W2) is located north of Glebe Farm, which discharges water southwards off-site via a ditch. Water is conveyed to this waterbody via the two larger ditches and a smaller boundary ditch. Water elevations in a nearby monitoring borehole indicate that this pond is in hydraulic continuity with groundwater.

Ordnance Survey mapping indicates the presence of two waterbodies at Wasperton Farm (W3). The southern waterbody is incorporated into the drainage system.

A further two ponds located to the east (W4) and southeast (W5) of the site boundary are considered likely to have originally been surface water-fed due to their location on bedrock (low permeability Mercia Mudstone, Section 2.6.2). However field ditches pass through these waterbodies, creating a connection to groundwater (Section 2.3.2).

A waterbody which is not shown on OS mapping (W6) is located on the eastern site boundary. This waterbody has also been connected to the adjacent field ditches.

#### 2.3.4 Springs

No springs are present on OS mapping within the same surface water catchment as the site.

#### 2.3.5 Surface water abstractions

Records of nearby licensed water abstractions were requested from the Environment Agency. Fourteen licensed surface water abstractions are located within 2 km of the site boundary. Ten of these abstractions are made from the River Avon and four from the Thelsford Brook.

The closest abstraction is located approximately 100 m west of the site boundary (Licence N<sup>o</sup> 18/54/13/076). It is used for direct spray irrigation at Wasperton Hill Farm between 1<sup>st</sup> March and 31<sup>st</sup> October. The licence permits 140,000 m<sup>3</sup>/a, and 2,000 m<sup>3</sup>/d. The next nearest abstractions are located c300 m west of the site boundary, from the River Avon, near the village of Wasperton. These abstractions are also for spray irrigation.

The locations of the abstractions are shown on *Drawing 3242/HIA/02*.

#### 2.3.6 Flooding

The majority of the site is located within Flood Zone 1, however southern parts are within Flood Zones 2 and 3 associated with Thelsford Brook. The flood risk associated with development of the site is discussed further in the Flood Risk Assessment (Ref 3242/FRA/F1, March 2022).

### 2.4 Sites of ecological and conservation interest

The MAGIC website ([www.magic.gov.uk](http://www.magic.gov.uk)) indicates that the site is not located within 2 km of a Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI) or Special Protection Area (SPA).

A Local Wildlife Site (LWS) is designated along the ditch adjacent to Holloway Farm and Wasperton Farm, and includes the waterbody W3 (Section 2.3.3). The location of the LWS is shown on *Drawing 3242/HIA/03*.

## 2.5 Landfills

There are no licensed landfill facilities within a 2 km radius of the site.

Six historic landfills are located within 2 km of the site boundary, all of which are between 1.6 km and 1.9 km north of the site. These sites received inert, industrial, commercial and household waste. The locations are shown on *Drawing 3242/HIA/04*.

## 2.6 Geology

### 2.6.1 Regional

The superficial deposits in the region are associated predominantly with the River Avon and situated on lower elevations. The superficial deposits comprise Alluvium, River Terrace 1 and River Terrace 2 deposits. The Alluvium generally comprises a mixture of clay, silt, sand and gravel. The River Terrace deposits comprise sand and gravel with local lenses of silt, clay or peat. The site is indicated to be entirely underlain by the River Terrace 2 deposits, which comprises the economic mineral. Isolated glacial deposits are located on some of the high points within the area.

The geology is shown on *Drawing 3242/HIA/05*, taken from the 1:50,000-scale BGS geological map for Warwick.

The regional bedrock geology comprises marls and mudstones of the Mercia Mudstone Group (MMG). The thickness of this unit in the area is indicated to be up to 100 m. The MMG outcrops on the higher ground of Wasperton Hill and Watchbury Hill to the east of the site, where a number of 'skerries' have been mapped by the BGS.

### 2.6.2 Local

Sixty-eight mineral investigation boreholes have been drilled at the site. Topsoil and overburden were encountered down to between 0.6 metres below ground level (mbgl) (44.18 mAOD) and 3.6 mbgl (42.41 mAOD) comprising clay, sandy clay, sandy silt or clayey silt.

Sand and gravel was encountered to between 40.60 m and 42.74 mAOD, with an average thickness of 2.3 m. The upper units of the mineral deposit comprise sand with varying

contents of silt, clay and gravel. Towards the base the strata predominantly comprise sand and gravel.

Sand and gravel was absent within seven mineral evaluation boreholes drilled in the northeast of the site. This site-specific data differs from the boundary defined on BGS mapping, indicating that the lateral limit of the sand and gravel deposit occurs within the site boundary.

Bedrock was encountered directly beneath the sand and gravel and was recorded as either a mudstone or firm to stiff clay.

## **2.7 Hydrogeology**

### **2.7.1 Aquifer status and regional context**

The superficial deposits at the site are classified by the Environment Agency as a Secondary A Aquifer. These are layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The bedrock beneath the site, the Mercia Mudstone, is designated as a Secondary B Aquifer. These are defined as layers that may store and yield limited amounts of groundwater within fissures and cracks.

The site is not located within a groundwater Source Protection Zone (SPZ), the nearest being located 530 m south of the site.

### **2.7.2 Local hydrogeology**

Water strikes were recorded in fifty-five of the sixty-eight mineral investigation boreholes. Generally, two water strikes were encountered; the first representing perched water within the overburden and the second within the sands, and sand and gravel deposits. The water strikes were at or close to the top of the sand and gravel strata and ranged between 1.4 m and 3.6 mbgl. For the boreholes where water strikes were not recorded, there was either no sand and gravel present (in the east of the site) or the boreholes were located in the west of the site, adjacent to Holloway Farm.

Monitoring standpipes were installed within four of the mineral investigation boreholes drilled in 2019 with a further five monitoring locations installed in 2020. One borehole has been damaged. Fifteen water monitoring records exist between November 2019 and November 2021. Hydrographs of the monitoring data are presented on *Drawing 3242/HIA/06*. The data

indicates that groundwater flow is westwards, towards the River Avon. A groundwater contour plot is shown on *Drawing 3242/HIA/07* using data from November 2021.

### 2.7.3 Groundwater abstractions

#### Licensed abstractions

A freedom of information request was submitted to the Environment Agency to identify the currently licensed abstractions.

One licensed groundwater abstraction is present within a 2 km radius of the site boundary. It is situated at Thelsford Corner, 800 m to its south. This licence (Nº 18/54/13/283) is held by Severn Trent Water for public water supply and allows the abstraction of 1,168,322 m<sup>3</sup>/y and 4,000 m<sup>3</sup>/d. However, it is noted that this volume also includes abstraction from two other boreholes located 4.2 km to the south, at Wellesbourne. Comparison with BGS borehole records indicates that both the Thelsford Corner borehole and Wellesbourne boreholes abstract from the Mercia Mudstone Group. A small source protection zone (500 m diameter) is associated with these boreholes.

The location of the abstraction is shown on *Drawing 3242/HIA/05*.

#### Unlicensed abstractions

Unlicensed abstractions are those with a volume of less than 20 m<sup>3</sup>/d. Data provided by Warwick District Council indicates three private water supplies within a 2 km radius of the site boundary. These were cross-referenced with data available from BGS mapping. No BGS borehole records were available for these abstractions. Anecdotal evidence indicates that a water abstraction for a livery exists at Green Barn, located approximately 380 m northeast of the site boundary. Details of the abstractions are summarised in *Table 3242/HIA/T2* and their locations are shown on *Drawing 3242/HIA/05*.

| 3242/HIA/T2: Private groundwater abstractions |               |                      |           |         |                                  |
|-----------------------------------------------|---------------|----------------------|-----------|---------|----------------------------------|
| Location                                      | NGR           | Distance & direction | Purpose   | Type    | Source                           |
| Brook Cottage                                 | 428042 261603 | 1.4 km N             | Domestic  | Well    | River Terrace Deposits           |
| Lower Watchbury Farm                          | 428048 260573 | 410 m N              | Domestic  | Well    | Mercia Mudstone                  |
| Watchbury Hill                                | 428373 260386 | 520 m NE             | Domestic  | Well    | Baginton Sand & Gravel Formation |
| Green Barn                                    | 428265 260301 | 380m NE              | Livestock | Unknown | Mercia Mudstone                  |

#### 2.7.4 Conceptual hydrogeology

Based on the background information, a hydrogeological conceptual model for the site has been constructed to be used as a basis for the risk assessment in Section 4. The conceptual model is summarised below.

The site is underlain by clayey overburden, River Terrace sand and gravel deposits, and the Mercia Mudstone Group.

The sand and gravel is the main groundwater bearing unit and the underlying low hydraulic conductivity Mercia Mudstone is considered to act as the base of the aquifer, restricting downward flow of groundwater. The sand and gravel aquifer is laterally confined by the topography in the east, and by the River Avon in the north and west. Groundwater within the Mercia Mudstone is expected to be confined to sandstone interbeds.

A shallow layer of clay, and locally silt, is present across the majority of the site and is likely to locally impede recharge from rainfall. Monitoring indicates that groundwater is at a depth of between 1.0 m and 3.3 mbgl, with a range of approximately 1 m throughout the year and an average depth of 1.6 mbgl. The watertable is therefore generally located close to the base of the overburden. The overall groundwater flow direction is towards the River Avon, indicating that groundwater and the river are in hydraulic continuity. However, comparison of ground elevations and groundwater level data indicate that a seepage face exists on the river bank, during normal flow condition.

Due to the shallow depth of groundwater, the waterbodies at the site are anticipated to be groundwater supported.

Ditches within the site are in hydraulic continuity with groundwater and receive run-off from the fields. A surface water drainage divide exists at the site, and as such the ditches convey water both southwards towards Thelsford Brook and westwards towards the River Avon. The network of ditches intersects the majority of waterbodies within the site, resulting in hydraulic continuity between the groundwater, ditches and waterbodies.

Groundwater abstractions are sourced both from the superficial sand and gravel deposits and subordinate sandstone beds within the Mercia Mudstone Group. The nearby unlicensed water abstractions target shallow strata and are hydraulically isolated from the site due to their location on a different aquifer to the site.

### **3 PROPOSED DEVELOPMENT**

#### **3.1 Mineral extraction**

It is proposed to extract the full thickness of sand and gravel and process the mineral on-site.

The plant site area containing the mineral processing plant, weighbridge, wheel wash and site offices will be constructed first, in approximately the centre of the site. Concurrently, Phase 1 of mineral extraction, to the south of the plant area, will be worked and the resultant void sub-divided to be subsequently used as silt settlement lagoon and freshwater lagoons.

Subsequent phases of mineral extraction will then be undertaken in an anticlockwise direction, starting in the north, with the mineral beneath the plant area being extracted during the final phase, Phase 12. Overburden stripped from the site will be temporarily stored on-site and used to progressively restore completed phases.

Due to the elevation of the groundwater, dewatering will be required in all phases to allow complete and safe mineral extraction and restoration.

The phasing plan is shown on *Drawing 3242/HIA/08*.

#### **3.2 Restoration**

Restoration will be concurrent with mineral extraction. Imported inert material will be used to backfill the majority of the quarry void. Site-won overburden stripped from the site during the extraction phases will be used to create the final landform. After the completion of restoration the land will be returned to agricultural use.

The lagoons constructed in Phase 1 will not be backfilled and the waterbodies would be allowed to revegetate naturally.

The proposed restoration scheme is presented on *Drawing 3242/HIA/09*.

#### **3.3 Water management**

##### **3.3.1 During mineral extraction**

A freshwater and silt lagoon system will be constructed in Phase 1 for mineral processing, an additional unlined lagoon will be constructed adjacent to Phase 1 and will be included in the recirculation of water. Part of the mineral deposit is situated below the watertable, therefore it is proposed to dewater to allow complete and safe mineral extraction. Each phase will be dewatered individually and pumping will continue until backfilling is completed to above the watertable. Hence, up to three phases may be being dewatered at one time.

Water in the quarry void will be directed to a sump and pumped to the lagoons in Phase 1. Depending on demand, water will be directed to the freshwater lagoon for top-up, or into an outfall lagoon which will discharge to the adjacent ditch via a gravity overflow.

### 3.3.2 Post-restoration

Upon completion of infilling of the quarry void dewatering will cease and groundwater levels will be allowed to return to their pre-extraction state. No active water management will take place following the completion of restoration.

The lagoons constructed within Phase 1 will create additional long-term storage of surface water on the site and the field boundary ditches will be retained.

### 3.3.3 Water inflow rates

Water inflow volumes have been calculated using the Dupuit-Forcheimer equation and long-term rainfall rates. Based on groundwater monitoring data, it has been assumed that a drawdown of 2 m will be necessary to fully dewater the sand and gravel. As up to three phases will be dewatered at once, the largest three consecutive phases (Phases 9, 10 and 11) have been used to determine the working area, as this will represent the largest groundwater inflow. A groundwater inflow rate of 6.2 l/s (538.5 m<sup>3</sup>/day) has been calculated, including rainfall incident to these phases gives an annual average inflow rate of 9.9 l/s (855.4 m<sup>3</sup>/day). It should be noted that the aquifer is of limited extent and the majority of water will be derived from aquifer storage, therefore inflow rates are likely to decrease following commencement of dewatering.

### 3.3.4 Licensing

The ability to abstract water for use and to allow dewatering at the proposed quarry has been investigated. Abstraction of water at the site would be regulated by the Environment Agency under the conditions detailed within the Warwickshire Abstraction Licensing Strategy (ALS) document.

There are no designated Principal Aquifers, with specific water availability assessments, in the vicinity of the site. Groundwater availability in the Secondary Aquifers would be determined by surface water resource availability. Therefore, groundwater is available for licensing, however restrictions apply. A Hands Off Flow (HOF) restriction applies to all new consumptive or partially consumptive abstractions in the catchment when flow at the Evesham gauging station on the River Avon drops below 409 Ml/day or below 1800 Ml/day at Deerhurst on the River Severn. Abstraction may be available for 318 days per annum, and 32.6 Ml/day is available for abstraction within the catchment. New licences will be time limited to 31<sup>st</sup>

March 2025, however, when an application is made within 6 years of a common end date (CED) the licence is generally granted with the following CED. Time limited licences will be renewed provided that the abstraction is sustainable, is an efficient use of water and there is a continued justification for the need.

The type of abstraction licence required depends on the use, duration, and volume of water abstracted. As it is intended to use water from dewatering in mineral processing a full licence would be required.

## 4 ASSESSMENT OF IMPACTS

### 4.1 Methodology

An assessment has been undertaken to determine the potential effects of the proposed mineral extraction and subsequent restoration on the water environment within and surrounding the site.

Potential impacts to the baseline and current conditions have been assessed for the short-term (operational) and long-term (post-restoration) phases of site development. The potential for unplanned incidents, such as spillage of hazardous substances, have also been taken into account. The following factors were considered:

- Magnitude of the impact
- Spatial extent of the impact
- Frequency of the impacts
- Timescale over which the impact may occur
- Cumulative impacts
- Sensitivity of the receiving environment

Mitigation measures and residual impacts have been considered as part of the assessment. The method of assessment is detailed in *Appendix 3242/HIA/A1* together with the matrices used to provide a robust method of assessment. Mitigation measures and residual impacts are discussed in Section 5.

### 4.2 Baseline sensitivity

The characteristics of the baseline water environment have been used to form a basis for the impact assessment. Details of how the baseline catchment sensitivity is assessed are provided in *Table 3242/HIA/A1.1* of *Appendix 3242/HIA/A1*.

Baseline sensitivities for various features surrounding the site are given in *Table 3242/HIA/T3*.

| 3242/HIA/T3: Receptor sensitivity |             |                                                                                                                                                                            |
|-----------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Receptor                          | Sensitivity | Reasons                                                                                                                                                                    |
| SURFACE WATER                     |             |                                                                                                                                                                            |
| On-site ditches                   | Low         | The ditches are artificial and exist to convey run-off. There are no abstractions from the features. A local wildlife site is designated along part of one of the ditches. |

| 3242/HIA/T3: Receptor sensitivity           |             |                                                                                                                                                                                                                                                                  |
|---------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Receptor                                    | Sensitivity | Reasons                                                                                                                                                                                                                                                          |
| River Avon & Thelsford Brook                | Medium      | Both watercourses are sources for water abstractions. Water is designated as being available for licensing. No water supported statutory sites are located downstream of the site. The River Avon is designated as a Local Wildlife Site.                        |
| Waterbodies within and surrounding the site | Low         | Small waterbodies which do not act as a supply of water. Waterbodies are both groundwater and run-off supported.                                                                                                                                                 |
| GROUNDWATER                                 |             |                                                                                                                                                                                                                                                                  |
| Superficial Aquifer                         | Medium      | The superficial deposits contribute to the baseflow of the River Avon and Thelsford Brook which support several water abstractions. Unlicensed abstractions in the area target the superficial deposits, however these are hydraulically isolated from the site. |
| Bedrock Aquifer                             | Medium      | Public water supplies abstract from the bedrock at distance from the site. Abstractions target sandstone bands within bedrock. Vertical hydraulic conductivity is expected to be low.                                                                            |

### 4.3 Radius of influence

The proposed dewatering will induce groundwater level lowering beyond the curtilage of the site. The lateral limit of such lowering is termed the 'radius of influence' and it can be estimated using empirical formulae. The estimated radius can then be used to identify the receptors that may be impacted by dewatering activities.

It should be noted that the degree of watertable lowering reduces exponentially from the centre of dewatering.

The saturated thickness of the sand and gravel has been determined from the borehole logs and monitoring data for the site and is assumed to be 2 m in all phases. The calculation assumes that all phases will be dewatered at once, therefore giving a worst-case estimate of the extent of drawdown. Due to the lack of site-specific data generic hydraulic conductivity values have been used, based on the presence of clay bands and the clay content of the sand and gravel.

The Sichardt equation was used to obtain an estimate for the radius of influence, giving a value of 64.5 m. Details of the calculations are given in *Appendix 3242/HIA/A2*.

## **4.4 Potential impacts during mineral extraction**

### **4.4.1 Groundwater flow and elevations**

Dewatering will be required for all phases of mineral extraction, however only two or three phases (or the equivalent area) will be open at any one time due, to the progressive restoration. The effects of dewatering would therefore be time limited. Calculations indicate that the groundwater drawdown due to dewatering would be limited to the immediate vicinity of the site, with the adjacent waterbodies being the only water-supported features within this radius.

The waterbodies and ditches will be retained throughout the extraction period. As these receive both groundwater and run-off, the impact from dewatering is expected to be minimal. W1 is the only waterbody within, or close to, the site which is not directly linked to the field ditches and is groundwater supported. It is therefore considered likely that this waterbody may be temporarily impacted by dewatering of the nearby phases.

The nearby unlicensed water supply boreholes are hydraulically isolated from the site as superficial deposits are absent between the extraction phases and the locations of the boreholes, additionally, two of the boreholes abstract from the bedrock. Dewatering at the site would therefore not impact the water levels at the unlicensed abstractions.

The site is adjacent to the River Avon, which is in hydraulic continuity with the sand and gravel deposits. At its closest approach the river is within 140 m of where dewatering will take place (Phase 5). Thelsford Brook is located c180 m from the closest extraction phase (Phase 7). Neither of these watercourses is likely to be impacted by dewatering due to their distance from the site.

The bedrock underlying the site comprises low permeability Mercia Mudstone, with subordinate sandstone beds. The bedrock dips shallowly, and the mineral investigation boreholes did not identify sandstone directly beneath the superficial deposits. The potential hydraulic connectivity between the superficial deposits and bedrock is therefore low. Consequently dewatering would have no discernible impact on the water-bearing horizons within the bedrock.

| 3242/HIA/T4: Water level impacts during development |             |            |              |
|-----------------------------------------------------|-------------|------------|--------------|
| Receptor                                            | Sensitivity | Magnitude  | Significance |
| SURFACE WATER                                       |             |            |              |
| On-site watercourses/ ditches                       | Low         | Low        | Minor        |
| River Avon & Thelsford Brook                        | Medium      | Negligible | Minor        |
| Waterbodies within and surrounding the site         | Low         | Low        | Minor        |
| GROUNDWATER                                         |             |            |              |
| Superficial Aquifer                                 | Medium      | Low        | Minor        |
| Bedrock Aquifer                                     | Medium      | Negligible | Minor        |

#### 4.4.2 Water quality

As with all quarries, mineral extraction operations can pose a contaminant risk to the water environment through the accidental release of hydrocarbons (or other contaminants) from mobile and fixed plant, or the release off-site of water with high suspended solid content.

Spill prevention measures and emergency spill procedures will be in place during operation to minimise the likelihood of contaminants being released into the environment. Further details are given in Section 5.

During the operational phase, dewatering would induce groundwater flow towards the quarry void, thereby preventing any potential contamination from migrating off-site. In the unlikely event that contaminated water entered the water management system, water would be prevented from leaving the site and the contamination dealt with in accordance with best practice. The vertical migration of contaminants would be impeded by the low permeability of the bedrock.

Any fines generated during dewatering will settle out within the sump to be created in the floor of the quarry void. Water would then be pumped to the settlement lagoons which would promote further settlement. Suspended solids will be produced during mineral washing. The silt-laden effluent water from the plant will be recirculated to the silt lagoons and allowed to settle. The silt settlement lagoon system will be self-contained therefore, there is no route for suspended solids to be discharged off the site to the external water environment.

Water quality impacts associated with imported inert fill are discussed in Section 4.5.2 below.

| 3242/HIA/T5: Water quality impacts during development |             |            |              |
|-------------------------------------------------------|-------------|------------|--------------|
| Receptor                                              | Sensitivity | Magnitude  | Significance |
| SURFACE WATER                                         |             |            |              |
| On-site watercourses/ditches                          | Low         | Low        | Minor        |
| River Avon & Thelsford Brook                          | Medium      | Low        | Minor        |
| Waterbodies within and surrounding the site           | Low         | Low        | Minor        |
| GROUNDWATER                                           |             |            |              |
| Superficial Aquifer                                   | Medium      | Low        | Minor        |
| Bedrock Aquifer                                       | Medium      | Negligible | Minor        |

#### 4.5 Potential impacts following restoration

##### 4.5.1 Groundwater flow and elevation

Restoration of the site will be achieved by the importation of inert material. The fill is expected to predominantly comprise soils and clays that will likely possess a lower bulk hydraulic conductivity than the pre-existing superficial deposits.

As groundwater flow within the superficial deposits is westwards, and the eastern boundary of the site effectively represents the margin of the superficial aquifer, there would not be a rise in groundwater level up-gradient of the site.

Shallow, low permeability overburden is present across most of the site which results in poor drainage. This overburden will be used in the shallow restoration of the site, therefore the near-surface drainage characteristics are likely to remain the same. Retention of the existing surface water features and the silt and freshwater lagoons within Phase 1 will increase the surface water storage capacity at the site.

Groundwater currently discharges to the River Avon to the west of the site. Replacing the sand and gravel with less permeable inert fill would result in less groundwater recharge and more surface water run-off. The run-off would be captured by the ditches and be conveyed to the River Avon via the Thelsford Brook.

Similarly, the reduction in groundwater flow to the waterbodies and watercourse, due to the placement of lower permeability material, will be balanced by additional run-off to these features, therefore impacts will be minimal.

| 3242/HIA/T6: Water level impacts following restoration |             |            |              |
|--------------------------------------------------------|-------------|------------|--------------|
| Receptor                                               | Sensitivity | Magnitude  | Significance |
| SURFACE WATER                                          |             |            |              |
| On-site watercourses/ditches                           | Low         | Low        | Minor        |
| River Avon & Thelsford Brook                           | Medium      | Negligible | Minor        |
| Waterbodies within and surrounding the site            | Low         | Low        | Minor        |
| GROUNDWATER                                            |             |            |              |
| Superficial Aquifer                                    | Medium      | Low        | Minor        |
| Bedrock Aquifer                                        | Medium      | Negligible | Minor        |

#### 4.5.2 Water quality

The backfilling of completed phases will be concurrent with mineral extraction and be undertaken using imported inert material for which an Environmental Permit will be required. The base of the extraction will comprise the low permeability Mercia Mudstone Group, which will restrict the downward movement of water.

The properties of the imported fill material will be controlled by strict Waste Acceptance Criteria (WAC) and procedures. This process will prevent any chemically unsuitable waste being placed at the site. The risk assessment which will be undertaken as part of the permitting process will fully assess the risk posed in the unlikely event that material exceeding the WAC limits is deposited at the site. Therefore, the potential for receiving non-compliant waste and resultant contamination will be prevented by the permitting process.

| 3242/HIA/T7: Water quality impacts following restoration |             |            |              |
|----------------------------------------------------------|-------------|------------|--------------|
| Receptor                                                 | Sensitivity | Magnitude  | Significance |
| SURFACE WATER                                            |             |            |              |
| On-site watercourses/ditches                             | Low         | Low        | Minor        |
| River Avon & Thelsford Brook                             | Medium      | Low        | Minor        |
| Waterbodies within and surrounding the site              | Low         | Low        | Minor        |
| GROUNDWATER                                              |             |            |              |
| Superficial Aquifer                                      | Medium      | Low        | Minor        |
| Bedrock Aquifer                                          | Medium      | Negligible | Minor        |

## 5 MITIGATION MEASURES AND RESIDUAL IMPACTS

### 5.1 During mineral extraction

#### 5.1.1 Water quality

##### Hydrocarbons

Impacts due to the accidental spillage of contaminants from fixed or mobile plant will be mitigated by adopting the following measures:

- i) All refuelling of mobile plant will take place on hardstanding in the plant area, thereby minimising the risk of spillages reaching the sand and gravel aquifer.
- ii) Fuel will be stored in a double skinned and/or bunded tank.
- iii) All plant will be maintained in accordance with best practice and manufacturer's specification. Where possible, all maintenance will be carried out off-site or on areas of hardstanding.
- iv) Written procedures will be in place for responding to an accidental spillage
- v) Spill kits will be available for use on-site in the unlikely event of such an occurrence.

By following the above measures, the risk posed to receptors during the site operation will be reduced as far as reasonably practicable and no further mitigation measures are considered necessary.

### 5.2 Post-restoration

#### 5.2.1 Water quality

The risk of degrading water quality by importing inert material will be mitigated by the implementation of strict Waste Acceptance Criteria, as well as other conditions that could be imposed by the Environmental Permit. No further mitigation measures are considered necessary.

## **6 CUMULATIVE IMPACTS**

There are no other mineral extraction or waste facilities in close proximity to the site, therefore cumulative effects are not envisaged.

## 7 SUMMARY AND CONCLUSIONS

Smiths Concrete are seeking Planning Permission for sand and gravel extraction at a greenfield site near Wasperton, Warwickshire. It is proposed to work the sand and gravel 'dry', which will require dewatering due to the presence of groundwater within the deposit. The site will be restored progressively to agricultural land using imported inert fill and site derived overburden.

The site is located on the eastern bank of the River Avon. The River Thelsford, a tributary of the Avon, passes to the south of the site. A network of interconnected ditches conveys water southwards through the site into the Thelsford Brook. Several natural waterbodies are incorporated into the drainage network.

The proposed development is situated on River Terrace deposits, comprising sands and gravels, which comprise the economic mineral. Mineral evaluation boreholes indicate that the sand and gravel is underlain by the Mercia Mudstone Group.

The sand and gravel is classed by the Environment Agency as a Secondary A Aquifer, however nearby groundwater abstractions target sandstone bands within the underlying Mercia Mudstone, a Secondary B Aquifer. The three nearby private abstractions are hydraulically isolated from the site.

There are no statutory sites of ecological interest within a 2 km radius of the site boundary. Part of the ditch along the northern boundary of the site and to the south of Wasperton Farm is designated as a Local Wildlife Site.

The groundwater flow direction in the sand and gravel is westwards, towards the River Avon, with which it is in hydraulic conductivity.

Dewatering at the site will require licensing and will be governed by the Warwickshire Abstraction Licence Strategy. Water is indicated as being available for licensing, however the catchment is subject to Hands Off Flow (HOF) conditions, with abstraction being available on average 318 days per year.

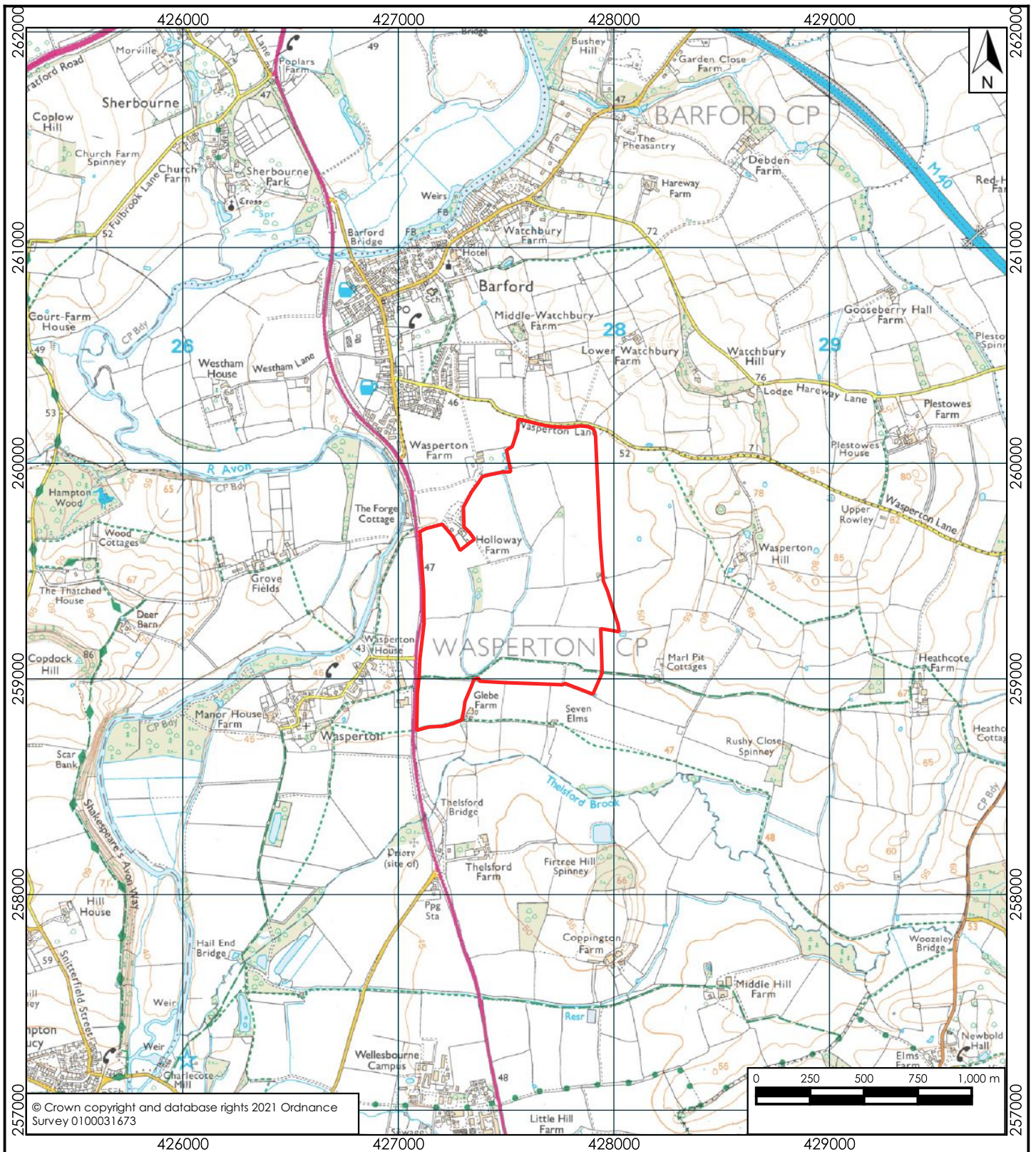
An assessment of the impacts associated with operations at the proposed site has been made with consideration of groundwater and surface water flows and quality, proximity to local areas of ecological interest and water abstractions. The potential impacts of the proposed operation and restoration have been assessed against the extant, greenfield conditions.

During mineral extraction dewatering is considered likely to only impact the water features internal and immediately adjacent to the site. However, as these features are both groundwater and run-off supported the impacts are likely to be minor.

Following restoration, decreased groundwater recharge is anticipated to be balanced by increased run-off. As the ditches will be retained, are connected with the waterbodies, and ultimately convey water to the same watercourse that the groundwater discharges to, the overall impact will be minor. The potential of imported restoration material to degrade water quality is considered to be minor due to the strict adherence to Waste Acceptance Criteria (WAC) to regulate the waste placed at the site. Any further mitigation measures would be identified during the permitting process.

It is considered that there will be no cumulative impacts associated with the proposed development of the site due to the absence of other quarries in the vicinity.

## DRAWINGS



### Legend

Site boundary

Scale correct at A4

**hafrenwater**   
environmental water management

Barkers Chambers • Barker Street • Shrewsbury •  
Shropshire • SY1 1SB  
www.hafrenwater.com • Tel. 01743 355 770

Client **Smiths Concrete Ltd**  
Southam Road  
Banbury  
Oxfordshire  
OX16 2RR

Title **Site Location**

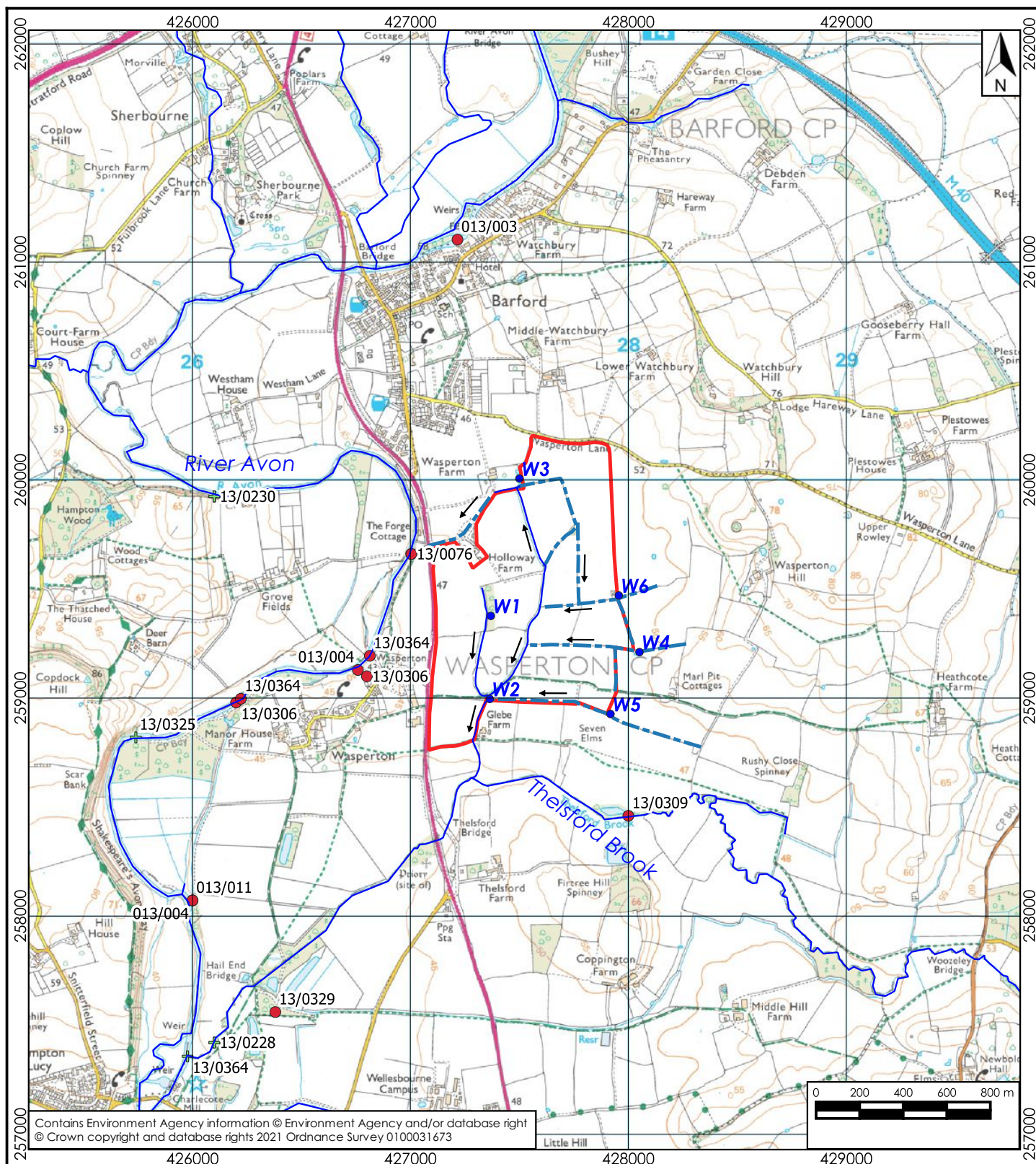
Project **Wasperton**

Drawing **3242/HIA/01**

Date **Mar 22**

Version **1**

Scale **1:25,000**



### Legend

- Site boundary
- On-site small field ditch
- Pond
- Surface water abstraction
- Watercourse
- Single point
- Surface water flow direction
- + Reach

Scale correct at A4

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Client  
Smiths Concrete Ltd  
Southam Road  
Banbury  
Oxfordshire  
OX16 2RR

Title  
Surface water features

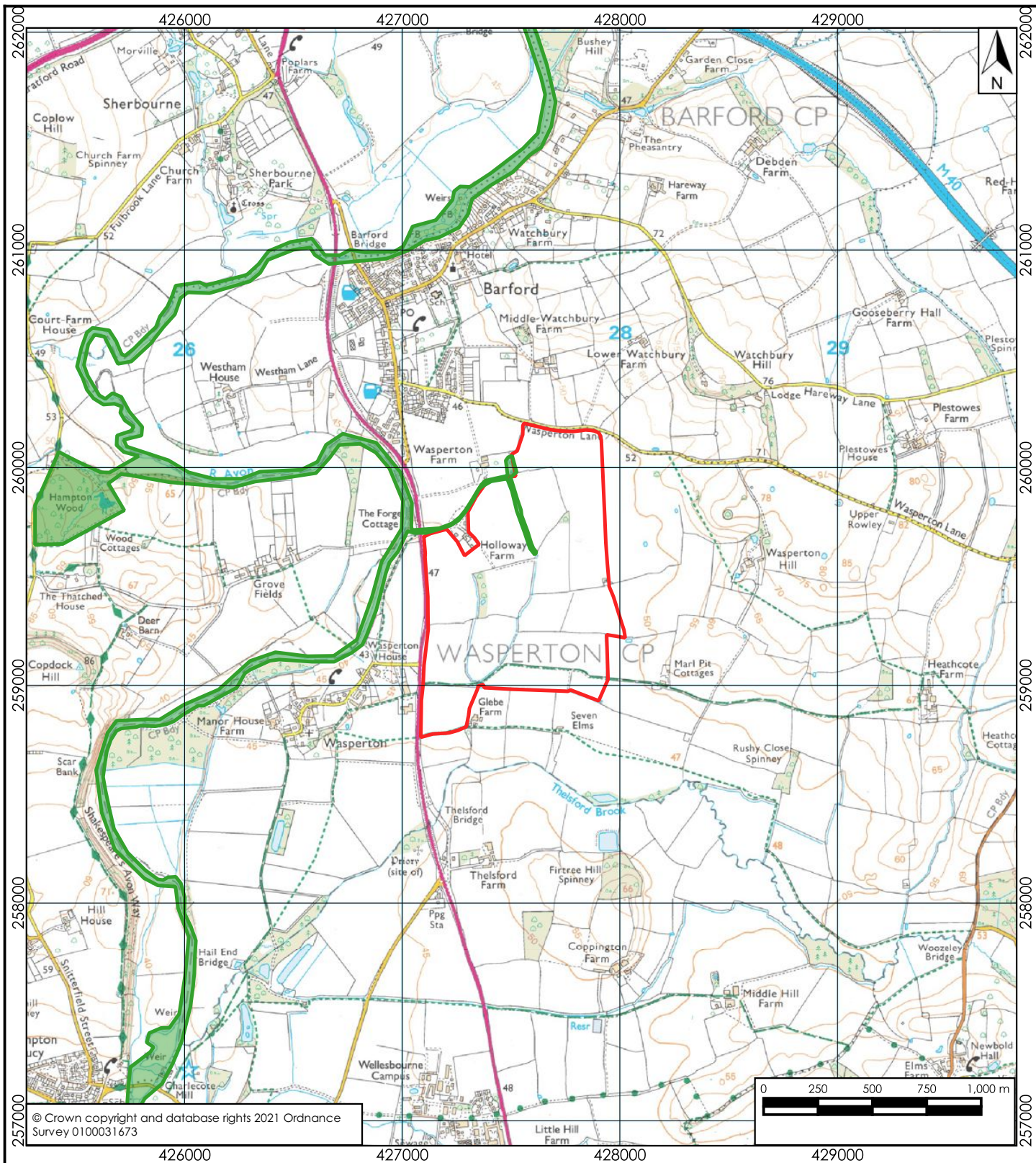
Project  
Wasperton

Drawing  
3242/HIA/02

Version  
1

Date  
Mar 22

Scale  
1:25,000



#### Legend

- Site boundary
- Local Wildlife Site

Scale correct at A4

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environmental water management

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Shropshire • SY1 1SB  
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Client **Smiths Concrete Ltd**  
Southam Road  
Banbury  
Oxfordshire  
OX16 2RR

Title **Ecological Sites**

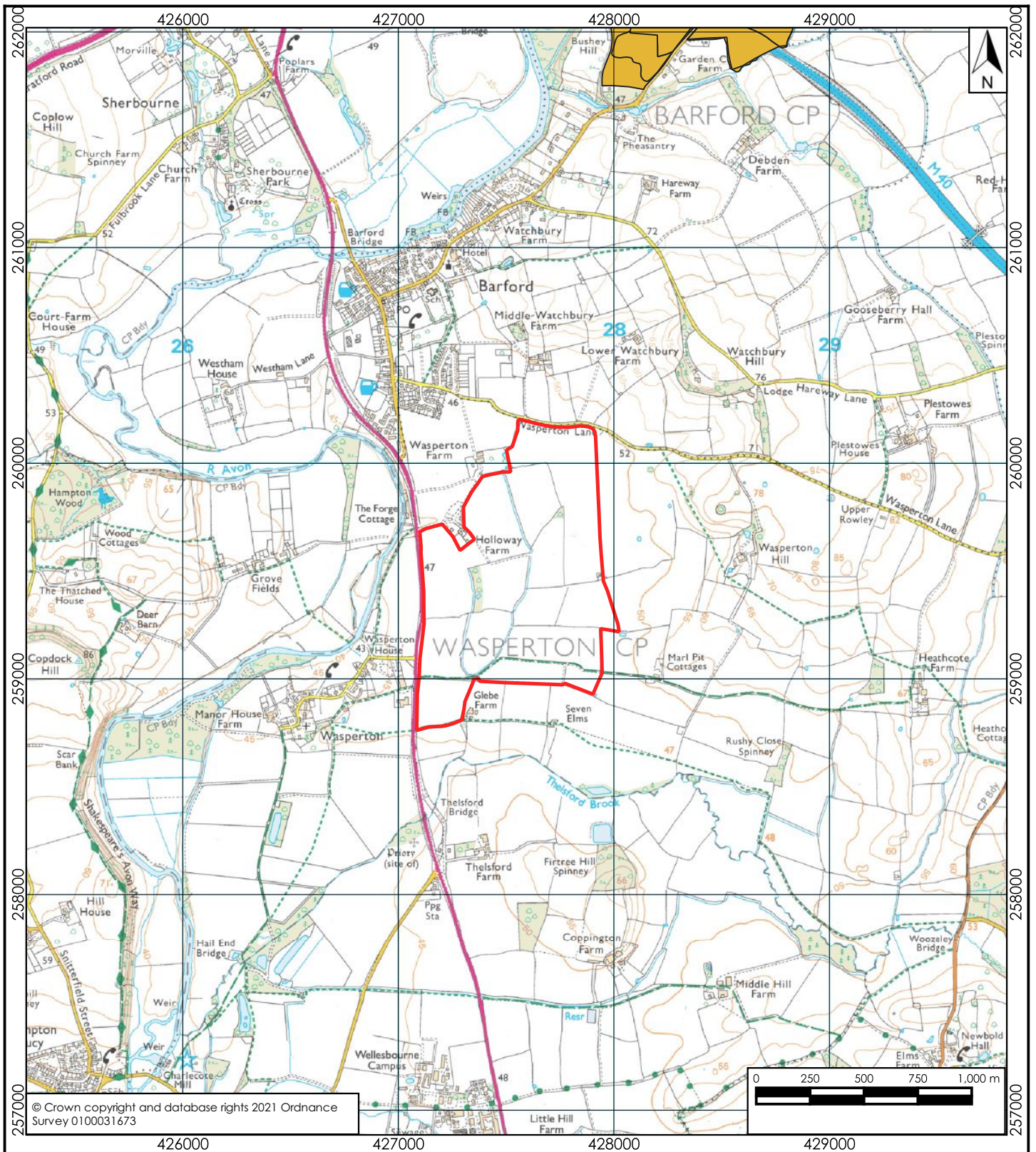
Project **Wasperton**

Drawing **3242/HIA/03**

Version **1**

Date **Mar 22**

Scale **1:25,000**



### Legend

- Site boundary
- Historic Landfill

Scale correct at A4

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Client **Smiths Concrete Ltd**  
Southam Road  
Banbury  
Oxfordshire  
OX16 2RR

Title **Landfill Sites**

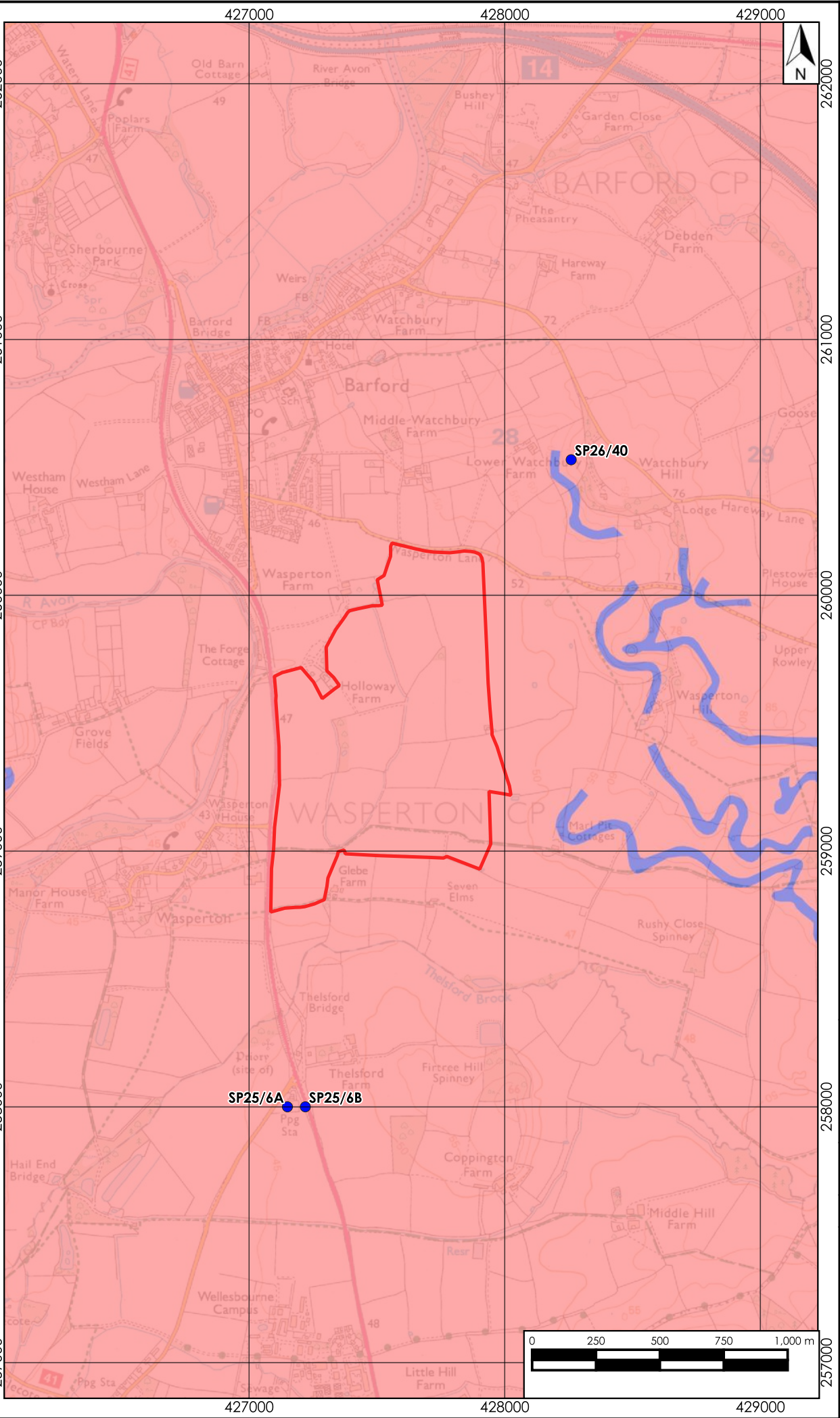
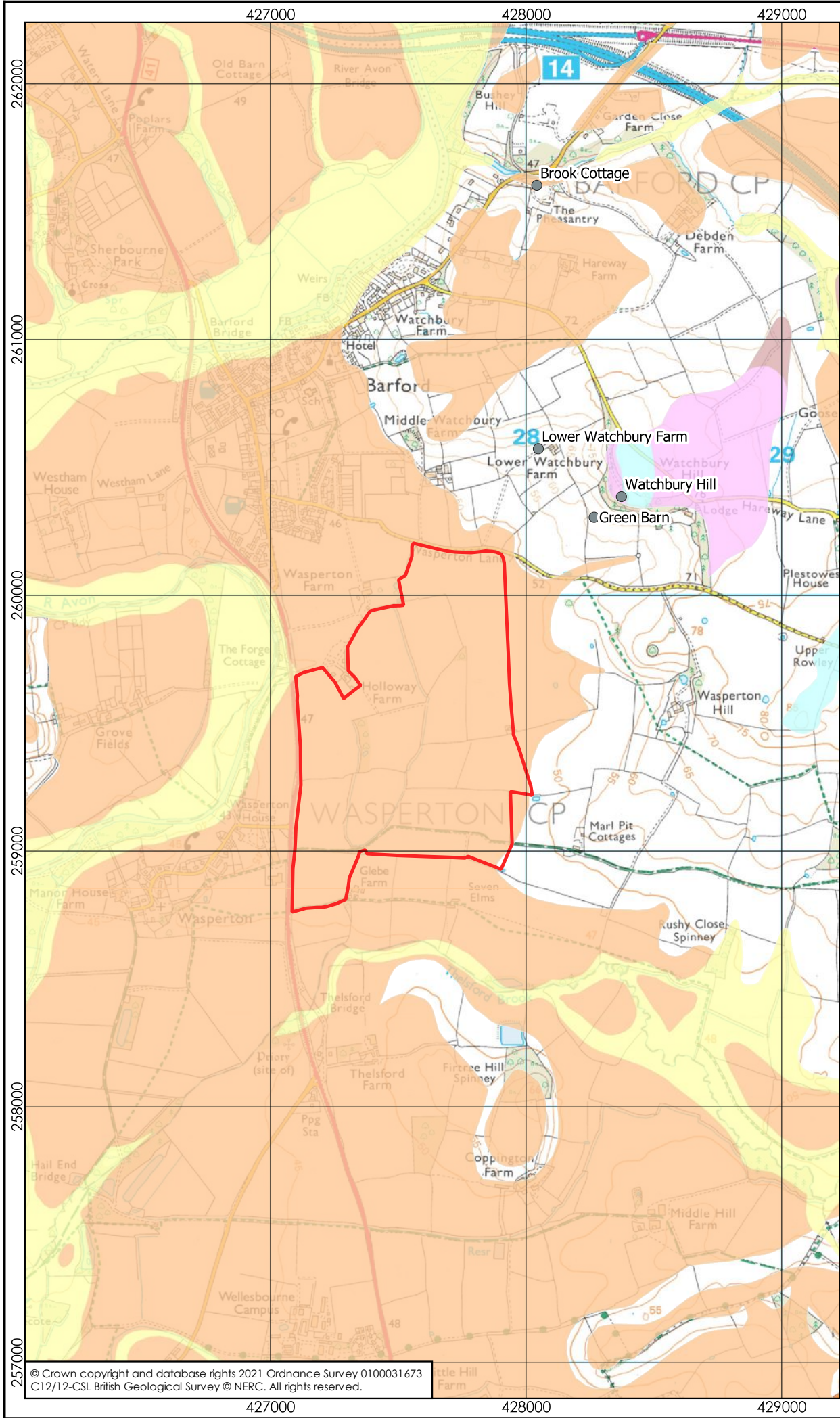
Project **Wasperton**

Drawing **3242/HIA/04**

Date **Mar 22**

Version **1**

Scale **1:25,000**

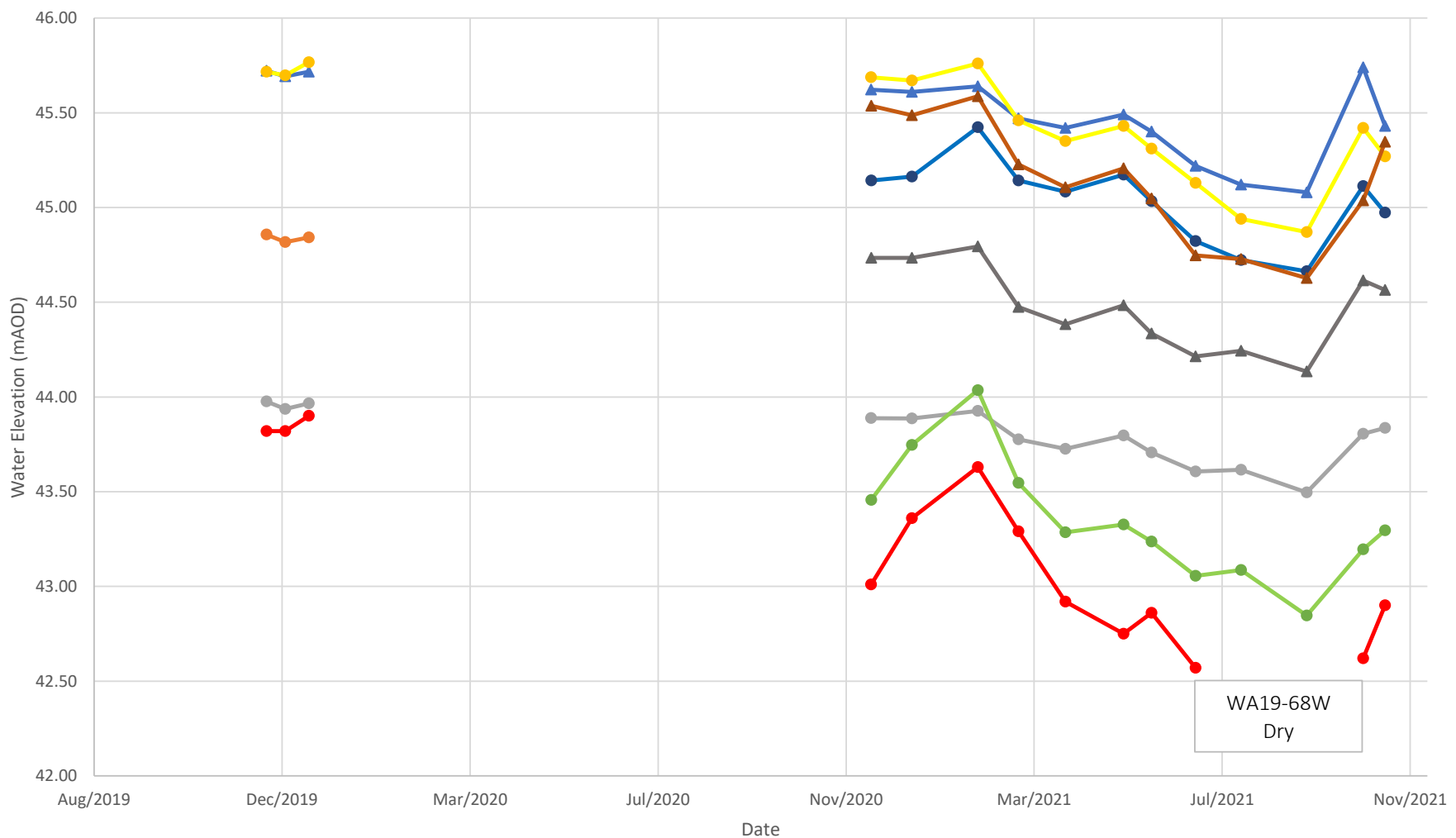


- Legend
- Site boundary
  - Licenced Borehole Abstraction
  - Private Water Abstraction
- Bedrock Geology
- Mercia Mudstone Group
  - Mercia Mudstone Group (Dolomitic Siltstone)
- Superficial Bedrock
- Alluvium
  - River Terrace Deposits
  - Head
  - Thrussington Member
  - Baginton Sand and Gravel Formation

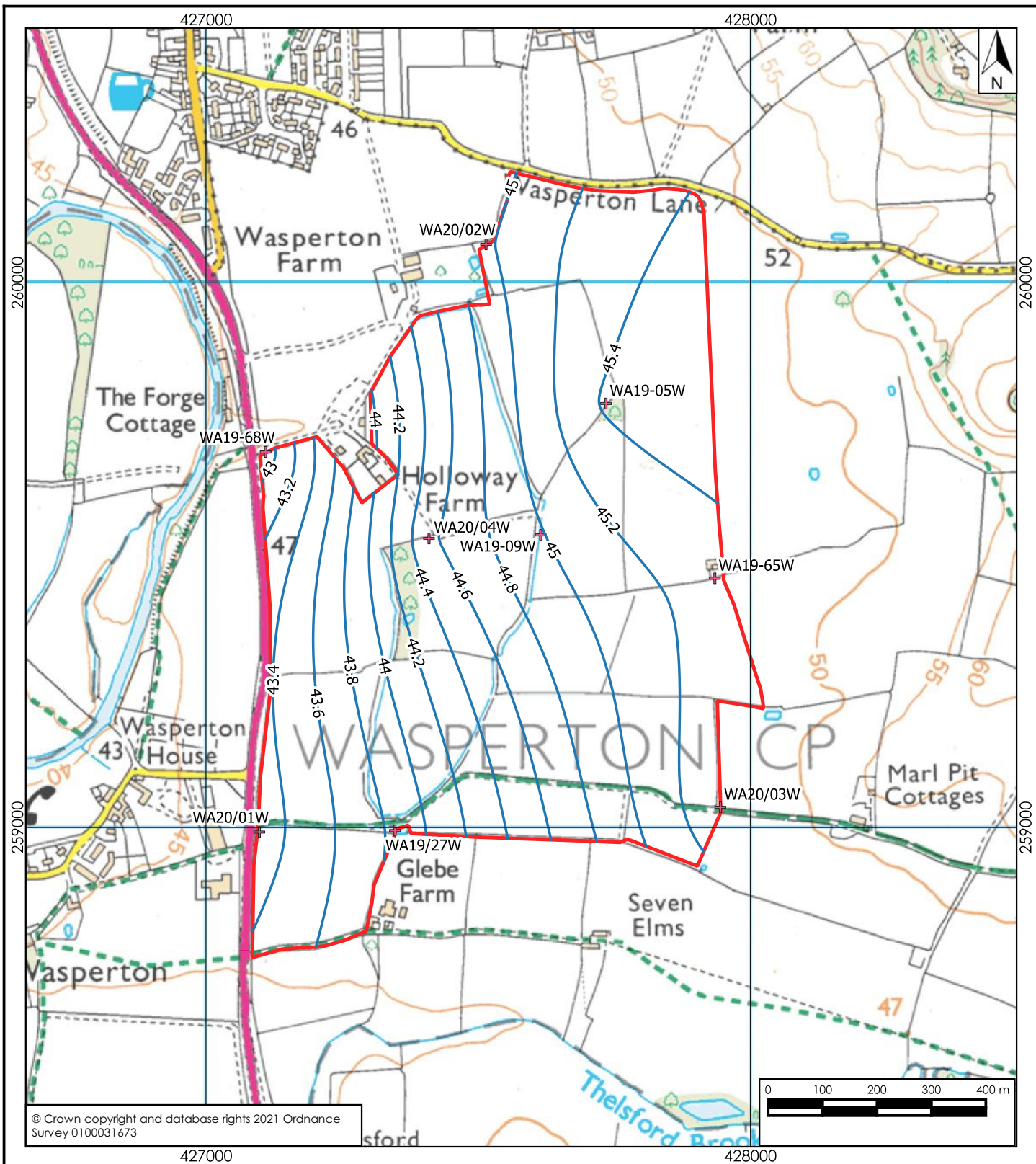
Scale correct at A3

|         |                                                                           |         |          |
|---------|---------------------------------------------------------------------------|---------|----------|
| Client  | Smiths Concrete Ltd<br>Southam Road<br>Banbury<br>Oxfordshire<br>OX16 2RR |         |          |
| Title   | Superficial & Bedrock<br>Geology                                          |         |          |
| Project | Wasperton                                                                 |         |          |
| Drawing | 3242/HIA/05                                                               | Version | 1        |
| Date    | Mar 22                                                                    | Scale   | 1:20,000 |

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WA19-05W
WA19-09W
WA19-27W
WA19-65W
WA19-68W
WA20-01W
WA20-02W
WA20-03W
WA20-04W



#### Legend

- Site boundary
- Groundwater Contours Nov 21 (m AOD)
- + Monitoring borehole

Scale correct at A4

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Client Smiths Concrete Ltd  
Southam Road  
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OX16 2RR

Title Groundwater Contours

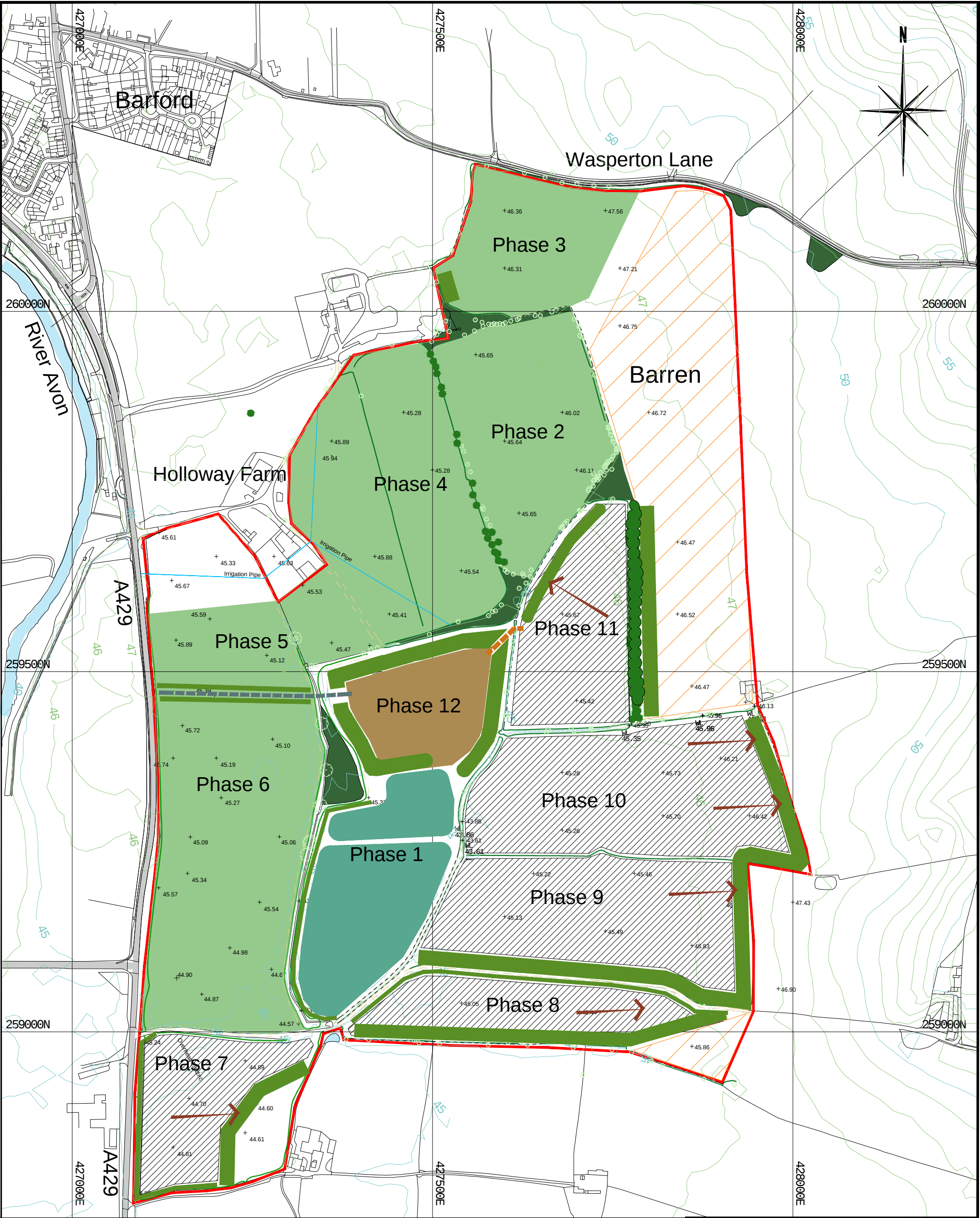
Project Wasperton

Drawing 3242/HIA/07

Version 1

Date Mar 22

Scale 1:10,000



LEGEND

- Working phase
- Screen/storage bunds
- Existing trees
- Proposed trees

- Water
- Grass
- Haul route



|             |                               |                               |          |
|-------------|-------------------------------|-------------------------------|----------|
| Site        | Wasperton                     |                               |          |
| Title       | Working plan 2<br>Phases 7-12 |                               |          |
| Scale at A3 | 1:5000                        | Date                          | Feb 2021 |
| Drawn By    | JEB                           | Checked By                    | IDB      |
|             |                               | Drawing No.<br>LD135- WSP-004 |          |



## **APPENDIX 3242/HIA/A1**

### **Assessment methodology**

## **Method of assessment**

The method of assessment of hydrological and aquatic effects has involved:

- Characterisation of the baseline environment
- Determination of the sensitivity of key catchments and watercourses
- Evaluation of the significance of predicted effects taking account of the magnitude of effects (before and after mitigation)
- Evaluation of the sensitivity of the baseline environment affected

A rigorous and consistent approach to the assessment has been adopted using matrices to help classify sensitivity of the resource and determine the scale and significance of effects.

### **Baseline sensitivity**

The characterisation of the baseline water environment has involved the review of data and identification of sensitivities. The characterisation of catchment sensitivities has been guided by the matrix presented in *Table 3242/HIA/A1.1* which lists indicative criteria.

The criteria for sensitivity are based approximately on hierarchy of factors relating to the quality of the aquatic environment. The criteria have been used to guide the analysis of the sensitivity of the baseline hydrological, hydrogeological and water quality environment.

| <b>Table 3242/HIA/A1.1: Catchment sensitivity classification</b> |                                                                                                                                                                                     |                                                                                                                                   |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Sensitivity category</b>                                      | <b>Sensitivity criteria</b>                                                                                                                                                         |                                                                                                                                   |
|                                                                  | <b>Adjacent to Application Area</b>                                                                                                                                                 | <b>Downstream/in catchment</b>                                                                                                    |
| High sensitivity                                                 | SSSI or Aquatic Natura 2000 site<br>Wetland/watercourse habitat of particular ecological importance<br>Highly vulnerable groundwater<br>Significant peat deposits on sloping ground | Aquatic Natura 2000 site or SSSI immediately downstream/ adjacent to site                                                         |
| Medium sensitivity                                               | Wetland watercourse habitat of particular ecological importance<br>Moderately vulnerable groundwater<br>Significant peat deposits                                                   | Aquatic Natura 2000 site or SSSI further downstream of the catchment.<br>Sensitive locally designated site of ecological interest |
| Low sensitivity                                                  | Low vulnerability groundwater<br>Superficial peat deposits                                                                                                                          |                                                                                                                                   |
| Not sensitive                                                    | No aquatic habitats or watercourses present<br>No significant groundwater present                                                                                                   |                                                                                                                                   |

### Impact prediction and evaluation

The prediction and assessment of effects on hydrology, hydrogeology and other aquatic resources has been undertaken using a series of tables to document the various potential impacts from aspects of the proposed project. Impacts have been predicted for the proposed development based on the guideline criteria for impact magnitudes set out in *Table 3242/HIA/A1.2*.

| Table 3242/HIA/A1.2: Impact magnitude |                                                                                                                                                                                                                              |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Impact magnitude                      | Guideline criteria                                                                                                                                                                                                           |
| High                                  | Total loss of, or alteration to, key features of the baseline resource such that post-development characteristics or quality would be fundamentally and irreversibly changed, eg watercourse realignment                     |
| Medium                                | Total loss of, or alteration to, key features of the baseline resource such that post-development characteristics or quality would be partially changed, eg in-stream permanent bridge works                                 |
| Low                                   | Small changes to the baseline resource which are detectable but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions, eg culverting of very small watercourses |
| Negligible                            | A very slight change from baseline conditions, which is barely distinguishable and approximates to the 'no change' situation, eg short-term compaction from plant movements                                                  |

Using these criteria a series of generic impacts have been predicted for the proposed development. Residual effects have been predicted taking into account site-specific mitigation.

The significance of the predicted effects has been assessed in relation to the sensitivities of the baseline resource. A matrix of significance was developed to provide a consistent framework for evaluation and is presented in *Table 3242/HIA/A1.3*. Guideline criteria for the various categories of effect are included in *Table 3242/HIA/A1.4*.

| Table 3242/HIA/A1.3: Significance matrix |             |          |          |            |
|------------------------------------------|-------------|----------|----------|------------|
| Magnitude                                | Sensitivity |          |          |            |
|                                          | High        | Medium   | Low      | Negligible |
| High                                     | Major       | Major    | Moderate | Minor      |
| Medium                                   | Major       | Moderate | Minor    | Minor      |
| Low                                      | Moderate    | Minor    | Minor    | None       |
| Negligible                               | Minor       | Minor    | None     | None       |

| Table 3242/HIA/A2.4: Significance of effects categories |                                                         |                                                                                                                                                                                                                             |
|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Significance                                            | Definition                                              | Guideline criteria                                                                                                                                                                                                          |
| None                                                    | No detectable change to the environment                 | No effects on drainage patterns, surface and groundwater quality or aquatic habitat                                                                                                                                         |
| Minor                                                   | A small but detectable change to the environment        | Localised changes in drainage patterns or groundwater flows, or changes resulting in minor and reversible effects on surface and groundwater quality or aquatic habitats                                                    |
| Moderate                                                | A larger, but non-fundamental change to the environment | Changes in water quality or quantity affecting part of a catchment or groundwaters of moderate vulnerability, or changes resulting in loss of conservation value to aquatic habitats or designated areas                    |
| Major                                                   | A fundamental change to the environment                 | Changes in water quality or quantity affecting widespread catchments or groundwater reserves of strategic significance, or changes resulting in substantial loss of conservation value to aquatic habitats and designations |

In the above classification, fundamental changes are those which are permanent, detrimental and would result in widespread change to the baseline environment.

The matrices used to guide the assessment have been applied with a degree of flexibility since the evaluation of effects would always be subject to particular location-specific characteristics which need to be taken into account. For this reason, the evaluation of impact significance, in particular, would not always correlate exactly with the cells in the relevant matrix where professional judgement and knowledge of local conditions may result in a slightly different interpretation of the impact concerned. Cumulative effects have been taken into account through prediction and evaluation of effects at a catchment-wide level.

## **APPENDIX 3242/HIA/A2**

### **Groundwater inflow and radius of influence calculations**

Calc sheet by:  
Version number:  
Date:

DI  
1  
19/04/2021



### Hydraulic parameters

|                                   | <i>min</i> | <i>most likely</i> | <i>max</i> |
|-----------------------------------|------------|--------------------|------------|
| Hydraulic conductivity, K (m/day) | 1          | 10                 | 15         |

### Dupuit-Forcheimer formula for inflows

|                                             |            |                            |            |
|---------------------------------------------|------------|----------------------------|------------|
| Initial saturated thickness, $h_0$ (m)      | 2          |                            |            |
| Seepage face, $h_s$ (m)                     | 0.25       |                            |            |
| Drawdown, $\Delta h$ (m)                    | 2          |                            |            |
| Saturated thickness, $h_w$ (m)              | 0.25       |                            |            |
| Radius of working area choice               | Circular   | ← select result from box 1 |            |
| Radius of working area, $r_w$ (m)           | 249.9      |                            |            |
|                                             | <i>min</i> | <i>most likely</i>         | <i>max</i> |
| Groundwater inflow, Q (m <sup>3</sup> /day) | 157.6      | 538.5                      | 675.1      |
| Groundwater inflow, Q (L/s)                 | 1.82       | 6.23                       | 7.81       |

### Box 1: CIRIA formula for effective radius of working area

|                      |                 |                    |
|----------------------|-----------------|--------------------|
| Length (m)           | 443             |                    |
| Width (m)            | 443             |                    |
|                      | <i>Circular</i> | <i>Rectangular</i> |
| Effective radius (m) | 249.9           | 282.0              |

### Box 2: Sichardt formula for radius of influence

|                                |            |                                                   |            |
|--------------------------------|------------|---------------------------------------------------|------------|
| Sichardt factor, Cs            | 3000       | (3000 for radial flow, 1500-2000 for linear flow) |            |
| Drawdown (m)                   | 2          |                                                   |            |
|                                | <i>min</i> | <i>most likely</i>                                | <i>max</i> |
| Radius of influence, $R_0$ (m) | 20.4       | 64.5                                              | 79.1       |

### Total ingress (groundwater + rainfall)

|                                          |             |                                      |            |
|------------------------------------------|-------------|--------------------------------------|------------|
| Groundwater inflow choice                | most likely | ← select result from Theim calcs     |            |
| Groundwater inflow (m <sup>3</sup> /day) | 538.5       |                                      |            |
| Runoff catchment (m <sup>2</sup> )       | 196000      |                                      |            |
|                                          | <i>min</i>  | <i>most likely</i>                   | <i>max</i> |
| Fraction of rainfall forming runoff      | 60%         | 80%                                  | 100%       |
| Fraction of rainfall choice              | max         | ← select proportion from table above |            |

|                | Avg. rainfall<br>per month<br>(mm) | Runoff rate<br>(m <sup>3</sup> /day) | Runoff rate<br>(L/s) | Runoff + GW<br>inflow<br>(m <sup>3</sup> /day) | Runoff + GW<br>inflow (L/s) |
|----------------|------------------------------------|--------------------------------------|----------------------|------------------------------------------------|-----------------------------|
| January        | 50.80                              | 321.2                                | 3.72                 | 859.6                                          | 9.95                        |
| February       | 37.30                              | 261.1                                | 3.02                 | 799.6                                          | 9.25                        |
| March          | 38.50                              | 243.4                                | 2.82                 | 781.9                                          | 9.05                        |
| April          | 43.10                              | 281.6                                | 3.26                 | 820.0                                          | 9.49                        |
| May            | 52.00                              | 328.8                                | 3.81                 | 867.2                                          | 10.04                       |
| June           | 50.90                              | 332.5                                | 3.85                 | 871.0                                          | 10.08                       |
| July           | 53.90                              | 340.8                                | 3.94                 | 879.2                                          | 10.18                       |
| August         | 53.50                              | 338.3                                | 3.92                 | 876.7                                          | 10.15                       |
| September      | 45.20                              | 295.3                                | 3.42                 | 833.8                                          | 9.65                        |
| October        | 58.90                              | 372.4                                | 4.31                 | 910.9                                          | 10.54                       |
| November       | 54.50                              | 356.1                                | 4.12                 | 894.5                                          | 10.35                       |
| December       | 52.50                              | 331.9                                | 3.84                 | 870.4                                          | 10.07                       |
| Annual average |                                    | 316.9                                | 3.7                  | 855.4                                          | 9.9                         |
| Annual maximum |                                    | 372.4                                | 4.3                  | 910.9                                          | 10.5                        |

**EXPLANATION OF CELL COLOURS**

---

|        |                  |
|--------|------------------|
| Yellow | Data entry       |
| Green  | Formulae         |
| Blue   | Select from list |

**EXPLANATION OF DUPUIT-FORCHEIMER FORMULA**

---

Dupuit-Forcheimer is valid for unconfined flow (i.e. variable saturated thickness) CIRIA 2000: Eq 6.7.

This is called the Theim-Dupuit equation by the Environment Agency 2007: box 3.2.

$$Q = \pi k \left[ \frac{h_o^2 - h_w^2}{\ln(r_o / r_w)} \right]$$

Where

- Q = groundwater ingress rate (m<sup>3</sup>/d)
- k = hydraulic conductivity (m/d)
- h<sub>o</sub> = sat'd thickness before drawdown (m)
- h<sub>s</sub> = height of seepage face in workings (m)
- h<sub>w</sub> = sat'd aquifer thickness after drawdown + h<sub>s</sub> (m)
- r<sub>w</sub> = radius of working area (m)
- r<sub>o</sub> = r<sub>w</sub> + radius of influence (m)

Effective radius of the working area estimate is based on CIRIA 2000: equation 6.5

**EXPLANATION OF SICHARDT FORMULA**

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Cited as equation 6.8 in CIRIA 2000, and equation 3.4 by Cashman and Preene 2001.

$$r = Ch \sqrt{k}$$

Where

- r = radius of influence (m)
- C = constant
- h = drawdown (m)
- k = hydraulic conductivity (m/s)
- r<sub>w</sub> = radius of working area (m)

**REFERENCES**

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Cashman and Preene, 2001. Groundwater Lowering in Construction: A Practical Guide. Spon Press. (Superseded by Cashman and Preene, 2020. Groundwater Lowering in Construction: A Practical Guide to Dewatering (3rd edition). CRC Press)

CIRIA, 2000. Groundwater control - design and practice. Report C515 (Superseded by CIRIA, 2007. Groundwater control - design and practice (second edition). Report C750.)

Environment Agency, 2007. Hydrogeological impact appraisal for dewatering abstractions. Science Report SC040020/SR1

## **APPENDIX 2**

### **Waste Acceptance Procedures**

## Wasperton Farm Quarry

Hanson Quarry Products Europe Limited

| WASTE ACCEPTANCE PROCEDURES |                  |
|-----------------------------|------------------|
| Revision                    | 0                |
| Description of change       | Initial release  |
| Author                      | Caulmert Limited |
| Effective Date              | 10/07/2024       |

### 1.1 Purpose

1.1.1 The purpose of this procedure is to ensure that:

- Only permitted wastes are accepted into Wasperton Farm Quarry for Recovery operation.
- Adequate Waste Acceptance and Duty of Care checks are carried out and records kept.
- Only permitted wastes are accepted onto Site.

1.1.2 This document outlines the waste acceptance procedures and criteria for wastes accepted at Wasperton Farm Quarry for the Deposit of Waste for Recovery Activity.

1.1.3 These waste acceptance procedures refer to the Landfill Directive (for inert landfills) for guidance on best practices for waste acceptance, however, the site does not operate a landfill.

### 1.2 Responsibility

- Site Manager
- Site Supervisor
- Site Operatives
- Weighbridge Personnel
- Technically Competent Manager

### 1.3 Referenced Documents

- Appendix 1 – Waste Information Form

### 1.4 Level 1 Basic Characterisation

#### Pre-Acceptance Information

1.4.1 Prior to wastes being delivered to Site, all waste streams will undergo Level 1 Basic Characterisation as per the Environment Agency guidance 'Dispose of waste to landfill', with reference to 'Waste acceptance procedures for deposit for recovery' guidance. The basic characterisation will include information relating to the following and will be provided by the waste producer/holder prior to waste acceptance:

- The source and origin of waste;
- The previous uses of any site that generates excavation or demolition waste;
- The Standard Industry Classification (SIC) code for the process that produced the waste (include a description and the characteristics of materials and products);
- Any description if the waste has undergone treatment;
- Any testing information provided where relevant (see below);
- Description of the appearance of the waste (smell, colour and physical form);
- The EWC code;
- For hazardous and mirror entry hazardous waste, the hazardous property code (hazardous wastes will not be accepted onto site, as per the permitted waste list).

#### Permitted List of Wastes

1.4.2 There will be three separate permitted waste lists. One waste list is for the Deposit for Recovery operation at Wasperton Farm Quarry, which will contain strictly inert waste types suitable for recovery operations, in accordance with Environment Agency guidance 'Check if your waste is suitable for deposit for recovery' (last updated 31<sup>st</sup> October 2022).

1.4.3 Waste lists are presented below in Tables 1 - 3 below.

**Table 1 – Permitted Waste Codes for Deposit for Recovery Operation**

| EWC Code     | Description                                                                                                | Restrictions for Waste Recovery Activity            |
|--------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>01</b>    | <b>WASTE RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS</b> |                                                     |
| <b>01 01</b> | <b>Wastes from mineral excavation</b>                                                                      |                                                     |
| 01 01 02     | Waste from non metalliferous excavation                                                                    | Restricted to waste overburden and interburden only |
| <b>01 04</b> | <b>Wastes from physical and chemical processing of non-metalliferous minerals</b>                          |                                                     |
| 01 04 08     | Waste gravel and crushed rocks other than those mentioned in 04 04 06                                      | -                                                   |
| 01 04 09     | Waste sand and clay                                                                                        | -                                                   |
| <b>10</b>    | <b>WASTES FROM THERMAL PROCESSES</b>                                                                       |                                                     |
| <b>10 12</b> | <b>Wastes from manufacture of ceramic goods, bricks, tiles and construction products</b>                   |                                                     |
| 10 12 08     | Waste ceramics, brick, tiles and construction products (after thermal processing)                          | -                                                   |
| <b>10 13</b> | <b>Wastes from manufacture of cement, lime and plaster and articles and products made from them</b>        |                                                     |
| 10 13 14     | Waste concrete                                                                                             | -                                                   |
| <b>17</b>    | <b>CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)</b>               |                                                     |
| <b>17 01</b> | <b>Concrete, bricks, tiles and ceramics</b>                                                                |                                                     |
| 17 01 01     | Concrete                                                                                                   | Selected C&D waste only                             |
| 17 01 02     | Bricks                                                                                                     | Selected C&D waste only                             |
| 17 01 03     | Tiles and ceramics                                                                                         | Selected C&D waste only                             |

|              |                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 01 07     | Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 1701 06                                                                                         | Selected C&D waste only. Metal from reinforced concrete must have been removed.                                                                                                                                                                                                                                                                                                                                |
| <b>17 05</b> | <b>Soil (including excavated soil from contaminated sites), stones and dredging spoil</b>                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                |
| 17 05 04     | Soil and stones other than those mentioned in 17 05 03                                                                                                                         | Excluding topsoil, peat; excluding soil and stones from contaminated sites                                                                                                                                                                                                                                                                                                                                     |
| <b>19</b>    | <b>WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE</b> |                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>19 12</b> | <b>Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified</b>                                          |                                                                                                                                                                                                                                                                                                                                                                                                                |
| 19 12 09     | Minerals only                                                                                                                                                                  | Wastes from the treatment of waste aggregates that are otherwise naturally occurring minerals. Does not include fines from treatment of any non-hazardous waste or gypsum from recovered plasterboard.                                                                                                                                                                                                         |
| 19 12 12     | Other wastes from mechanical treatment of wastes other than those mentioned in 19 12 11.                                                                                       | Restricted to crushed bricks, tiles, concrete and ceramics and fines and soils from treated inert wastes from Hanson's or Smiths Concrete Aggregates Recycling Facilities. Metal from reinforced concrete must be removed. Does not include treated wastes/fines from road plantings. Does not include fines from treatment of any non-hazardous waste treated off-site or gypsum from recovered plasterboard. |
| <b>20</b>    | <b>MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>20 02</b> | <b>Garden and park wastes (including cemetery waste)</b>                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                |
| 20 02 02     | Soil and stones                                                                                                                                                                | Only from garden and parks waste; excluding topsoil, peat.                                                                                                                                                                                                                                                                                                                                                     |

1.4.4 Wastes having any of the following characteristics shall **not** be accepted:

- Consisting solely or mainly of dusts, powders or loose fibres.
- Wastes that are in a form which is either sludge or liquid.
- Clinical and Healthcare wastes.
- Hazardous wastes.

### Mirror entries – Mirror-Hazardous Waste

1.4.5 The waste code types in Tables 1 & 2 above include:

AN – Absolute Non-Hazardous

MN – Mirror Non-Hazardous

1.4.6 To ensure that no hazardous wastes are accepted to site, as part of the information required for the 'Waste Information Form', new waste streams are required to be identified against an EWC code and confirmed that it is not hazardous waste. Any wastes given an EWC code that is not permitted or is hazardous, will not be accepted to site.

### Waste Acceptance Testing

1.4.7 As part of Hanson's pre-acceptance procedures, supplementary testing of inert wastes prior to accepting will only be undertaken if there is any doubt about the provenance of the waste as described by the producer, or if the material is suspected of being derived from a contaminated site or may contain materials that could increase the risk of pollution to the environment.

1.4.8 Where sampling and testing is required, the producer/carrier of the waste will be required to undertake the testing, and this will be done prior to accepting onto site. Testing will check to ensure the wastes are within the Waste Acceptance Criteria (WAC) leaching limit values for inert landfills (except road plantings which will not be deposited in the recovery area and are excluded from recovery waste list). Any wastes considered potentially contaminated will not be accepted to site until analytical results have been provided from a UKAS accredited (or equivalent) laboratory by the customer/producer. Laboratory results indicating that the materials are inert will be accepted to site.

1.4.9 Sampling will be undertaken in accordance with a sampling plan developed to the British Standard BS EN14899:2005 'Characterisation of waste – sampling of waste materials' and may be carried out by the waste producer or the site Operator.

1.4.10 All samples sent to the laboratory for analysis must be representative of the source waste.

1.4.11 The samples will be screened or sorted to remove any materials unsuitable for testing e.g. large lumps of concrete.

1.4.12 Details of sampling frequency are provided in Environment Agency guidance 'Dispose of waste to landfill' (last updated 21<sup>st</sup> April 2021) and will depend on the size of the waste batch and if the waste is homogenous or heterogenous.

1.4.13 As per the analytical methods described in the technical guidance WM3, the analytical laboratory (whether in-house or external provision) should, wherever possible, be accredited by the United Kingdom Accreditation Services (UKAS) (or equivalent) to BS EN ISO/IEC 17025 'general requirements for the competence of testing and calibration laboratories' for the scope of the work.

- 1.4.14 Where testing is required, only wastes not exceeding the inert WAC limit values provided in Table 3 below will be sent to the Deposit for Recovery activity:

**Table 3 – Inert Waste Acceptance Criteria (WAC) Leaching Limit Values**

| Component           | L/S = 2 l/kg | L/S = 10 l/kg |
|---------------------|--------------|---------------|
|                     | mg/kg        | mg/kg         |
| As                  | 0.1          | 0.5           |
| Ba                  | 7            | 20            |
| Cd                  | 0.03         | 0.04          |
| Cr <sup>total</sup> | 0.2          | 0.5           |
| Cu                  | 0.9          | 2             |
| Hg                  | 0.003        | 0.01          |
| Mo                  | 0.3          | 0.5           |
| Ni                  | 0.2          | 0.4           |
| Pb                  | 0.2          | 0.5           |
| Sb                  | 0.02         | 0.06          |
| Se                  | 0.06         | 0.1           |
| Zn                  | 2            | 4             |
| Cl                  | 550          | 800           |
| F                   | 4            | 10            |
| SO <sub>4</sub> *   | 560          | 1,000         |
| TDS **              | 2,500        | 400           |
| Phenol Index        | 0.47         | 1             |
| DOC **              | 240          | 500           |

\* If the waste does not meet these values for sulphate, it may still be considered as complying with the acceptance criteria if the leaching does not exceed either of the following values: 1 500 mg/l as CO at L/S = 0,1 l/kg and 6 000 mg/kg at L/S = 10 l/kg. It will be necessary to use a percolation test to determine the limit value at L/S = 0,1 l/kg under initial equilibrium conditions, whereas the value at L/S = 10 l/kg may be determined either by a batch leaching test or by a percolation test under conditions approaching local equilibrium.

\*\* If the waste does not meet these values for DOC at its own pH value, it may alternatively be tested at L/S = 10 l/kg and a pH between 7,5 and 8,0. The waste may be considered as complying with the acceptance criteria for DOC, if the result of this determination does not exceed 500 mg/kg. (A draft method based on prEN 14429 is available).

\*\*\* The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride.

- 1.4.15 In addition to the leaching limit values above in Table 3, inert wastes must meet the following additional limit values for total content of organic parameters in Table 4 below:

**Table 4 – Limit Values for Organic Parameters**

| Parameter                                     | Value (mg/kg) |
|-----------------------------------------------|---------------|
| TOC (total organic carbon)                    | 30,000 *      |
| BTEX (benzene, toluene, ethylbenzene, xylene) | 6             |
| PCBs (polychlorinated biphenyls)              | 1             |
| Mineral oil (C10 to C40)                      | 500           |

\*In the case of soils, a higher limit value may be admitted by the competent authority, provided the DOC value of 500 mg/kg is achieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7.5 and 8.0.

- 1.4.16 If in doubt, test results/site investigation and report findings must be provided for the wastes to confirm its suitability for accepting onto site. Wastes will not be accepted without the correct documentation.

**Wastes that do not require testing**

- 1.4.17 The following waste codes in Table 5 are on the list of wastes **not requiring testing**, provided restrictions are adhered to (this does not apply if there is a possibility the waste has been contaminated – guidance taken from Landfill Directive for inert landfills, however it should be noted this site does not operate a landfill):

**Table 5 – List of Inert Wastes Acceptable at Inert Landfills Without Testing**

| EWC Code | Description                                      | Restrictions                                                                                                                                                                                      |
|----------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 01 01 | concrete                                         | Selected construction and demolition waste only – with low contents of other types of materials (like metals, plastic, soil, organics, wood, rubber etc.). The origin of the waste must be known. |
| 17 01 02 | bricks                                           |                                                                                                                                                                                                   |
| 17 01 03 | tiles and ceramics                               |                                                                                                                                                                                                   |
| 17 01 07 | mixtures of concrete, bricks, tiles and ceramics |                                                                                                                                                                                                   |
| 17 05 04 | soil and stones                                  | Excluding topsoil, peat; excluding soil and stones from contaminated sites.                                                                                                                       |
| 20 02 02 | soil and stones                                  | Only from gardens and parks wastes; excluding topsoil, peat.                                                                                                                                      |

- 1.4.18 In accordance with WM3, if a waste is classified as ‘absolute non-hazardous’ by the waste producer/holder then the identified code will suffice, with no further assessment or testing necessary during Basic Waste Classification.
- 1.4.19 The waste types in Table 5 above will still undergo thorough waste acceptance and waste Duty of Care checks at the Site by suitably trained staff, which will include confirming the source and origin of the waste, ensuring the correct waste code and description has been assigned to the waste supported by a visual inspection upon arrival at the site and during unloading, and checking the waste type(s) is in the list of permitted waste types for the site.

## **1.5 Level 2 Compliance Testing**

### Incoming Waste Loads to Site

- 1.5.1 The function of compliance testing is to periodically check regularly generated waste streams coming into site based on the full Basic Characterisation test results. Regularly generated means the waste is of consistent quality and generated by the same process.
- 1.5.2 The wastes will only be sampled for compliance testing if the waste stream was originally tested during the Basic Characterisation pre-acceptance stage.
- 1.5.3 Wastes exempt from testing requirements during Basic Characterisation are also exempt from compliance testing (see Table 5). These wastes however will need checking for compliance on a routine basis with Basic Characterisation information (other than test results) to ensure no contamination is suspected.
- 1.5.4 It is unlikely compliance testing will be necessary for the majority of incoming waste streams, as most incoming inert wastes will not require testing during Basic Characterisation (i.e. those in Table 5).

- 1.5.5 Where compliance testing is required, the waste only needs assessing against a limited number of parameters. Based on the results of Basic Characterisation, the main parameters of the waste are identified to understand its variability. It is then possible to sample and test the waste against those parameters during compliance testing.
- 1.5.6 It is recommended compliance WAC testing is carried out at least once a year for each waste stream that requires Level 1 Basic Characterisation testing. The Operator proposes that compliance WAC testing of the inert waste types that require compliance testing will be undertaken on 1 sample in every 10,000 tonnes of that particular waste type stream. This may be changed in frequency as deemed appropriate by the Operator but will be no less than once a year per waste stream.
- 1.5.7 For larger waste streams, compliance testing will be carried out more frequently, as deemed necessary by the Operator.
- 1.5.8 It is the responsibility of the site manager and weighbridge operator to ensure that loads are not accepted if annual compliance testing results have not been received.
- 1.5.9 Where a load fails the compliance test, a full basic characterisation will need to be completed by the waste producer and the process outlined in this Waste Acceptance Procedure will be followed as for a new waste stream.

## **1.6 Level 3 On-Site Verification**

- 1.6.1 Loads arriving to site can only be accepted if the 'Waste Information Form' and a transfer note has been completed. A check will be made by suitably trained staff to ensure that the 'Waste Information Form' has been completed and approved and all pre-acceptance information provided, including Basic Characterisation information and waste Duty of Care documentation.
- 1.6.2 A visual inspection will also be made on the wastes before and after unloading and compared with the waste type and description of the waste load provided in the waste transfer note.
- 1.6.3 Upon arrival, all incoming vehicles are required to report to the site office, details are checked against the relevant waste transfer notes and 'Waste Information Form' to ensure that the load is acceptable at site and listed in the permitted waste types in Tables 1 & 2. Waste is visually inspected, weighed and details recorded including supplier, waste type, quantity and quality of waste being accepted.
- 1.6.4 The following details will be provided to Hanson by the waste producer/carrier as detailed in the Waste Transfer Note (WTN):
  - 1. Date and time of delivery
  - 2. Name and address of the waste producer
  - 3. Description of waste types including quantity
  - 4. How the waste is contained e.g. loose/ container type
  - 5. Carriers name and address

6. Drivers name, signature and vehicle registration No.
  7. Signature or initial of person(s) accepting/inspecting the waste
  8. Additional handling details (e.g. notes made by the driver after inspecting the load)
  9. SIC code of the premises which produced the wastes (if relevant)
  10. Waste hierarchy declaration
  11. Information on previous treatment of the waste e.g. manual or mechanical
- 1.6.5 Weighbridge personnel will also check that all vehicles are a registered waste carrier, any expired certificates will be advised to contact the Environment Agency. The appointed person must ensure that any carriers own waste transfer note template complies with the requirements of the Duty of Care for Waste (Section 34 of the Environmental Protection Act 1990).
- 1.6.6 If on the weighbridge, waste cannot be accurately categorised or described incorrectly on the waste transfer note, the haulier will be directed to a quarantine area where a suitably qualified person will inspect the waste and make a decision whether it will be accepted to site or not, or if further information or testing is required.
- 1.6.7 If accepted, the haulier is directed by the appointed person to deposit the waste into either the storage and treatment area, or down to the quarry face.
- Non-Conforming Wastes & Quarantine
- 1.6.8 Wastes that are identified at the weighbridge as potentially non-conforming will be rejected from site.
- 1.6.9 If the non-conforming load has already been unloaded on site, it will, wherever possible, be reloaded back onto the delivery vehicle and the office of the carrier notified by telephone.
- 1.6.10 If the load is of unknown, or potentially hazardous, composition, it will be isolated in the Quarantine Area for inspection. Site operations will be adjusted if necessary to ensure no unauthorised person comes within close proximity of the quarantined waste.
- 1.6.11 Further investigations may include contact with the carrier and the producer to seek to determine the likely composition of the waste. It may also include taking samples in order to determine the chemical composition of the waste. These investigations will be undertaken by the site manager, or other suitably qualified person under the supervision of the site manager.
- 1.6.12 The quarantined load will remain on site until an agreed course of action has been agreed with all relevant parties, which may include rejection from site or, in the case of hazardous waste, a Waste Consignment note (or equivalent) will be raised prior to rejection. Actions implemented will be recorded in the Site Log Book and on the 'Waste Information Form'.
- 1.6.13 A Quarantine Area, with suitable stand-off distances, will be available at all times for the temporary storage of potentially non-conforming or potentially hazardous wastes unloaded at the site, prior to removal from site.

### Waste Rejection

- 1.6.14 A load may be rejected from site due to a non-conforming waste delivery, incomplete or unsatisfactory accompanying documentation, the physical appearance of the waste (including smells and dust) do not fit the description on the Waste Transfer Note, testing results show the waste exceeds the inert WAC limit and other reasons. This list is not exhaustive, and Hanson reserves the right to reject, cancel or reschedule waste loads at any time.
- 1.6.15 Waste rejection will be done in accordance with the site's Waste Rejection Procedure and record made in the Site Log Book.

## **1.7 Waste Enquiry**

- 1.7.1 For every new waste stream enquiry proposed to be brought to site, the waste holder needs to provide information to confirm that the proposed waste stream will be compliant with the permit. It will undergo Basic Characterisation (Level 1 Assessment) as per Section 1.4 above to ensure that it complies with the waste types listed in Table 1 and/or Table 2 and where necessary will undergo testing to ensure it complies with inert Waste Acceptance Criteria (WAC) leaching limit values and will be suitable for the Deposit for Recovery activity at the site.
- 1.7.2 Information required to achieve basic characterisation (defined in Section 1.4) is contained on the 'Waste Information Form' (Appendix 1) and will require the customer/waste carrier/producer to sign the form before loads can be accepted onto site.
- 1.7.3 The producer/carrier has a legal duty (issued under duty of care, Section 34 of the Environmental Protection Act 1990) to accurately describe the waste as per the 'basic characterisation of waste' (Section 1.4), they will be asked about the nature of the wastes intended for site and given/emailed a copy of the 'Waste Information Form' to fill in (Appendix 1).
- 1.7.4 If during the waste enquiry it is confirmed that the soils, aggregates or construction/demolition wastes originate from a potentially contaminated site or contaminated hotspot within a site, then an analysis is required for that hotspot as per the technical guidance WM3 to confirm if the waste is hazardous or non-hazardous. Only wastes confirmed as non-hazardous (inert only) properties will be accepted to site.

## **1.8 Waste Information Form**

- 1.8.1 The 'Waste Information Form' only needs to be filled in for a new waste stream, not every waste load to site.
- 1.8.2 The Waste Information Form must be completed by the customer/waste producer/carrier, on completion of the form the waste producer/carrier will return the form and Site Management will make decision based on the information provided whether the waste can be accepted to site.

- 1.8.3 The purpose of the 'Waste Information Form' is to ensure sufficient information is provided to achieve basic characterisation from the customer.
- 1.8.4 If on Section 2 of the 'Waste Information Form' it is stated that the waste is sourced from a contaminated hotspot, then the Operator will need to be supplied with laboratory results to confirm that it is not hazardous and suitable to be accepted to site. Any wastes containing asbestos, are excessively dusty or odorous will not be accepted to site. Other information including any details regarding site investigations, borehole reports or chemical analysis which are available for that waste stream should be supplied.
- 1.8.5 Any wastes confirmed with hazardous properties or wastes that cannot be confirmed as inert will require an analysis of the waste (as per technical guidance WM3). It is also imperative that the waste producer/carrier correctly fills in the 'Details of Existing and/or Previous use of site'. Waste analysis must follow BS EN 14899:2005 'Characterisation of waste – sampling of waste materials'.
- 1.8.6 The producer must provide the European Waste Catalogue Code (EWC) of the intended waste in the 'Waste Information Form'. Wastes that do not appear in the site's environmental permit will not be accepted to site and the 'Waste ACCEPTED/NOT ACCEPTED' section of the form will be completed and signed off by Site Management stating the reason why wastes were not accepted.
- 1.8.7 Wastes will not be accepted to site unless the weighbridge clerk has received confirmation that the waste has been reviewed by Hanson Quarry Products Limited and approved for acceptance. Approved persons will check the customer has a current Waste Carriers licence, and the up to date information can be checked by Site Management and/or Environment Agency website.
- 1.8.8 Waste producers/carriers will identify the waste they are importing by using a Waste Transfer Note. The weighbridge operator will check against the list of approved EWC Codes and complete the Waste Transfer Note ensuring all fields are completed. A copy will be retained in the weighbridge and then sent for archiving.
- 1.8.9 After wastes have been characterised (See Section 1.4), all wastes undergo on-site verification checks which include a visual inspection of the waste load, and if suitable, the waste will be accepted to site.

## **1.9 Waste Duty of Care**

- 1.9.1 As per the waste Duty of Care Code of Practice (last updated 26<sup>th</sup> November 2018), if you carry out a waste operation that changes the nature or composition of the waste, you are regarded as a producer of the waste when it leaves your site.

### Records

- 1.9.2 Records relating to the acceptance and rejection of waste at the weighbridge are summarised below and will be retained by the Operator:

- Weighbridge tickets
- Duty of Care transfer notes
- Waste Rejection records

## WASTE INFORMATION FORM

### SECTION 1

(To be completed by the waste producer/carrier)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Waste Producer:</b><br><b>Contact Name:</b><br><b>Telephone Number:</b>                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| <b>Waste Carrier:</b><br><b>Contact Name:</b><br><b>Telephone Number:</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <b>Source of Waste:</b><br>e.g. address, postcode, grid ref<br>etc)                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| <b>EWC Code of waste brought to<br/>site (must be EWC permitted to<br/>be brought to site)</b><br><br><b>Is the EWC a mirror non-<br/>hazardous entry?</b>                                                                                                                                                                                                                                                                                                                                           |  |
| <p>If the waste is not known or reasonably suspected to be hazardous – <b>please confirm</b> the following observations with a tick:</p> <p>I cannot see or smell hydrocarbons or other chemicals in the waste ( )</p> <p>I cannot see visible pieces of asbestos containing materials in the waste ( )</p> <p>The waste does not, and is not likely to contain pieces of asbestos ( )</p> <p>The waste does not come from a contaminated site where hazardous waste is proven to be present ( )</p> |  |
| <p>If all the above is confirmed – continue to Section 2 'Declaration'</p> <p>If any parts above are not confirmed, you must follow the waste classification technical document WM3 guidance to assess and classify the waste as; non-hazardous, uncontaminated and acceptable for site – See Chemical Analysis Section below.</p>                                                                                                                                                                   |  |
| <b>Provide a copy of assessment,<br/>including any waste analysis<br/>undertaken</b>                                                                                                                                                                                                                                                                                                                                                                                                                 |  |

## SECTION 2 DECLARATION

**(To be completed by the waste producer/carrier)**

*I confirm that to the best of our knowledge the information provided with this form are:*

- 1) Representative of the material to be disposed of, and;*
- 2) Waste is acceptable, and;*
- 3) (where further assessment was required evidence has been provided to determine the waste characterisation and composition and to confirm the waste is non-hazardous .*

*Signed by the Waste Producer/Carrier:*

.....

*Dated:*

## SECTION 3 DECISION CRITERIA

**(to be completed by site management)**

**Date WIF sent for assessment:**

**Waste ACCEPTED? (YES, NO)**

**Waste NOT ACCEPTED (YES, NO)**

**State reasons for above**

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