



## Demolition and Remediation Method Statement

Upper Heyford

September 2012

On behalf of:

Heyford Park Settlements LP

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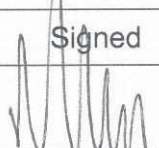
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**CLIENT NAME: Heyford Park Settlements LP**

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### **Appendix A**

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D3035_12_3	NSA Area 3
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D3035_14	Post-Remediation Conceptual Model
D3035_15	Cross-Section Typical Ex-Situ Windrow
D3035_16	Indicative Water Treatment Schematic

### **Appendix B**

#### **Permit to Proceed**

## 1 Introduction

- 1.1 VertaseFLI Limited (VertaseFLI) has been employed to undertake asbestos removal, demolition and remediation works to select areas of the New Settlement Area (NSA) at Upper Heyford, Oxfordshire (site) on behalf of Heyford Park Settlements LP (client). These works form part of a wider scope of works associated with the redevelopment of this site. The client will appoint Waterman Energy, Environmental & Design Limited (Waterman) as overseeing environmental consultant for the works.
- 1.2 This document is intended to provide a detailed methodology on how the works will be completed and to allow discharge of relevant planning conditions. Whilst this document relates to the areas as detailed herein, additional areas may be incorporated into these works.
- 1.3 The site boundary for these works which includes an overview of individual Areas is shown on drawing D3035\_12B at **Appendix A**. More detail on the seven individual Areas is provided on Drawings D3035\_12\_1 to D3035\_12\_7 respectively.
- 1.4 This Demolition & Remediation Method Statement (DRMS) has been prepared in consideration of various other documents, namely:
- Site Wide Type 3 Pre Demolition Asbestos Surveys by CWE Services Limited.
  - Factual Report on Ground Investigation by Jomas Associates, dated April 2012.
  - Preliminary Generic Quantitative Environmental Risk Assessment by Waterman, dated May 2012.
  - Remediation Strategy by Waterman, dated September 2012.
  - Controlled Waters DQRA by Waterman, dated July 2012.
  - Relevant Conditions contained in Outline Planning Permission reference 10/01642/OUT, dated December 2011.

It is assumed the reader is familiar with the aforementioned prior to reading this DRMS.

- 1.5 There are a number of other important considerations which will be incorporated into final operational Risk Assessments and Method Statements. This includes:
- Existing Services Survey by Lorne Stewart.
  - Bat Survey by Thomson Ecology.
  - Tree Protection Plan.

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Works will not commence until the aforementioned have been completed and incorporated into the operational Risk Assessments and Method Statements.

- 1.6 It is proposed that follow-on trades and in particular, those employed to install new and / or alternative services, will undertake some work at the same time as these works. This important interaction will ultimately be managed by the client, but VertaseFLI will act as Principal Contractor in accordance with CDM Regulations 2007, including overseeing other trades as and when agreed with the client.
- 1.7 In combination with the various reports prepared by Waterman, approval of this DRMS, together with the subsequent validation and completion report, is intended to discharge relevant planning conditions as detailed in the Waterman Remediation Strategy.

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## 2 Project Constraints

- 2.1 Numerous services are present on site, some of which need to be maintained, at least in part during the works to maintain continuity of services to local residents and commercial premises. The client has previously commissioned an extensive survey of these services and programmed the disconnection of such in a manner to ensure continuity where required. Demolition or disconnection works shall not commence until the client has issued specific instructions, hereafter referred to as Permission to Proceed (PTP), confirming works are safe to commence. Such instruction shall not be given until alternative services are available beforehand.
- 2.2 The client has previously commissioned various ecological surveys. There are a small number of trees and small shrubs to be removed. Where possible, these will only be removed outside the nesting bird season (April – September). In the event that any require removal during this season, they shall be properly inspected for nesting birds beforehand, by an ecologist employed by the client.
- 2.3 A number of buildings have been identified as actual or potential bat roosts. These buildings have been clearly identified and will not be disturbed until they have been cleared for works by an appropriately qualified ecologist employed by the client and a PTP issued. The ecologist will obtain any licences required for the works. It is possible that such buildings may need to be demolished in a specific manner as a consequence of potential presence of bats. Where such buildings have been identified, specific Method Statements shall be prepared and will be subject to approval by the ecologist. This may also include some supervision / inspection of the actual works to ensure compliance with the Bat Licence.
- 2.4 We understand there are number of buildings and / or structures that need to be preserved. The client will advise on these prior to any works and by approving any individual demolition via a PTP.
- 2.5 As some areas of the site are to remain occupied, access to such areas will need to be maintained throughout these works. To this end, a detailed traffic management plan will be prepared and regularly reviewed throughout the works.
- 2.6 The client is responsible for ensuring buildings are nominally empty of redundant furniture, wastes, drums, etc.

- 2.7 We understand there are no Party Wall issues affecting these works, although the client will confirm this via a PTP before works commence on each building.
- 2.8 It is possible that additional areas / buildings may be incorporated into the works as they progress or that phasing of the works may change. Requirements as detailed herein and in particular those relating to (Type 3) pre demolition surveys / refurbishment and bat surveys, will be commissioned by the client prior to any works to such areas / buildings. Whatever the final phasing of the works, they shall be completed in accordance with the details contained herein.
- 2.9 The client is proposing to commission a survey which will establish a tree protection plan prior to these works commencing. This tree protection plan and the recommendations and conditions contained therein will be incorporated into these works so as to avoid unauthorised removal of any protected tree, and to ensure the canopy and roots of such trees are not damaged by these works.
- 2.10 An example PTP is enclosed at **Appendix B** for information.



### **3 Summary of Works**

3.1 The works covered by this document can be summarised as follows:

- (i) Preparation of various permits, licences, permissions as required and external approval of such as necessary.
- (ii) Removal and disposal of licensed asbestos.
- (iii) Phased demolition of above ground buildings and structures.
- (iv) Phased demolition and processing of hardstandings, foundations, obstructions and redundant buried services.
- (v) Above ground and underground tank de-commissioning.
- (vi) Remediation.
- (vii) Environmental monitoring and reporting.

3.2 Further detail is provided on these activities throughout this document. In addition to this DRMS, detailed task specific health & safety Risk Assessments and Method Statements will be prepared and disseminated as necessary in accordance with CDM Regulations. This will be prepared and approved internally and by the CDM Co-ordinator appointed by the client.

3.3 In addition to approval of this document, there are a number of other approvals and permissions required before either some, or any part of the works can commence. These include:

- (i) Temporary trade effluent discharge consent for foul sewer.
- (ii) Site specific deployment for Environmental Permit.
- (iii) Site Waste Management Plan (SWMP).
- (iv) Materials Management Plan (MMP).
- (v) S.80 application.
- (vi) ASB5 notification and registration of site as hazardous waste producer.
- (vii) Bat Licence.

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#### **4 Stakeholder Liaison**

- 4.1 The client shall be responsible for liaison with local residents, operators of local businesses and the Upper Heyford Management Company. However, VertaseFLI shall provide whatever support, written or personal attendance, deemed necessary to maintain good relations with neighbours, such as keeping them informed of the progress of works and to establish a line of communication for requests for information or to register a complaint.
- 4.2 Waterman shall be the main point of contact with the appropriate regulators. VertaseFLI shall submit various records and documents as dictated by the contract specification (including those required to discharge relevant planning conditions) to Waterman who will then be responsible for submission to the regulators and gaining the appropriate approvals thereof. The exception to this shall be the site specific deployment form prepared for the Environmental Permit and discharge consent to foul sewer compliance, which shall be the sole responsibility of VertaseFLI.

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## 5 Site Investigations & Risk Assessments

### 5.1 Site Investigations

5.1.1 Various investigations, surveys and inspections have been undertaken as described in section 1.4. Based upon the findings of the various site investigations, Waterman have undertaken human health and controlled waters risk assessments and prepared a Remediation Strategy. We understand all the aforementioned except the Remediation Strategy have received regulatory approval. Regulatory approval shall be defined as the Environment Agency and Cherwell District Council Contaminated Land Officer / EHO. The Remediation Strategy is to be submitted to the regulators with this DRMS.

### 5.2 Risk Assessment & Remediation Objectives

5.2.1 The aforementioned have established remediation objectives and targets based upon the proposed end use of residential development with private gardens. This document contains detail on how remediation works will be undertaken, including validation and reporting of such. Approval of this document and the subsequent Completion and Validation report is intended to discharge relevant planning conditions.

5.2.2 DQRA by Waterman has confirmed the absence of significant groundwater contamination. Whilst some works will be undertaken on localised groundwater and LNAPL as described later in this document, groundwater remediation proper is not required. However, remedial targets protective of controlled waters receptors have been established and will be used to validate voids and soils for reuse.

5.2.3 There are localised areas of TPH, PAH and heavy metal contamination which pose a potential risk to proposed end users. Remediation of TPH contamination is detailed later in this document. Other non volatile contaminants which may pose a risk to human health will be dealt primarily through breaking the source-pathway-receptor linkage through the introduction of a pathway break, and reuse of soils on a suitable for use approach.

5.2.4 There is currently no risk to human health through land gases or volatiles. However, additional post demolition / remediation gas monitoring shall be undertaken by others to confirm the absence of such and undertake an assessment and design of gas protection to buildings, should this be deemed necessary.

- 5.2.5 The site is predominately covered in buildings and hardstandings. Existing building floor slabs, external hardstandings and underlying construction sub base will be removed as part of the demolition works. Following processing, recycled aggregate will be utilised as described elsewhere in this document. Areas of existing topsoil will also be stripped and stockpiled for subsequent reuse in the proposed development.
- 5.2.6 A watching brief shall be maintained throughout the demolition works and in particular the removal of building slabs and external hardstandings for any areas of unforeseen contamination including asbestos in the ground.

## 6 Information on Specific Activities

### 6.1 *Licensed Asbestos Removal*

- 6.1.1 VertaseFLI will employ a suitably licensed and experienced specialist asbestos removal contractor. They have been provided with the reports for refurbishment and demolition surveys commissioned by the client. All works will be undertaken in full compliance with the recently revised Asbestos Regulations 2012. All notifiable asbestos works will be under the supervision of an asbestos competent supervisor at all times.
- 6.1.2 Licensed asbestos removal works will be undertaken in a phased manner in accordance with a phasing plan to be agreed with the client. Licensed asbestos removal works may be undertaken to more than one building at any given time.
- 6.1.3 The client shall issue a PTP for each building prior to *any* works commencing. In the context of asbestos removal, this shall confirm the following:
- that it is a building to be demolished,
  - that an asbestos survey report is available and remains valid,
  - that there are either no ecological constraints outstanding (bats), or that a licence is required and the conditions have been incorporated into method statements,
  - that services have been disconnected.
- 6.1.4 Each building or structure shall be assessed by the competent asbestos supervisor who shall then produce detailed specific Risk Assessments and Method Statements as required. It should be noted that in reality this will be covered by one or two generic Risk Assessments and Method Statements, but the purpose of the initial assessment is to confirm the appropriateness of the generic Risk Assessments and Method Statements. As a minimum, the old hospital (building 582) will be assessed separately and a building specific Risk Assessment and Method Statement will be prepared, due to the size and poor condition of the building.
- 6.1.5 All personnel employed on asbestos removal works will be properly inducted and will sign confirmation that they have received inductions, including all necessary Risk Assessments, Method Statements and site rules.

- 6.1.6 Demolition works shall not be undertaken to any building or structure until all licensed asbestos work has been completed. Where licensed asbestos works are underway, that building shall be ring fenced and no unauthorised access permitted.
- 6.1.7 As mentioned previously, specific health & safety Risk Assessments associated with the removal of asbestos fall outside the scope of this document, other than to confirm all licensed asbestos works are undertaken within an airtight enclosure with a three stage air lock access / egress arrangement which is smoke tested prior to works commencing. A full decontamination unit will be used to allow operatives working on licensed asbestos to change at the beginning and end of each shift and at break times. Therefore, there are no risks from asbestos outside of buildings during the removal of asbestos.
- 6.1.8 Following removal, licensed asbestos will be placed into a red asbestos bag which in turn is double bagged within a transparent bag, within the air tight enclosure. It is then placed into a secure and lockable asbestos skip prior to removal to a suitably licensed disposal facility. Consignment notes for the transportation and disposal of all asbestos wastes will be maintained on site during works and included in the final completion report.
- 6.1.9 The asbestos supervisor shall undertake a final inspection to confirm all licensed asbestos has been removed. He / she shall confirm buildings are clear of licensed asbestos by way of issuing the various certificates as required by the Asbestos Regulations 2012, such as issuing a Certificate of Re-occupation, which in turn will allow a PTP to be issued to allow subsequent demolition to commence.

## **6.2 Above Ground Demolition**

- 6.2.1 Demolition works will be undertaken in a phased manner in accordance with a phasing plan to be agreed with the client. All demolition works will be supervised by an experienced demolition supervisor at all times. Demolition works will be undertaken to more than one building at any given time.
- 6.2.2 VertaseFLI shall issue a PTP for each building prior to demolition works commencing. In the context of demolition, this shall confirm the following:
- that it is a building to be demolished,
  - that all licensed asbestos has been removed,
  - that there are no ecological constraints outstanding (bats), or that a licence is required and the conditions have been incorporated into method statements,

- that services have been disconnected or the structure is no longer serving the wider Upper Heyford community.

6.2.3 Demolition of above ground buildings and infrastructure can be sub-divided into the following tasks:

- (i) Soft strip.
- (ii) Non licensed asbestos removal.
- (iii) Mechanical demolition.

6.2.4 A key objective of the soft strip is recovery of materials that would cause cross contamination of recycled aggregate during subsequent crushing and classification and, recovery of materials to increase recyclates and avoid disposal.

6.2.5 The soft strip shall collect materials and stockpile / store separately in order to achieve the aforementioned objectives, i.e., metal, clean wood, hazardous waste, etc. Storage and location of stored wastes will consider and address any environmental issues that may arise such as dust, run off and the like.

6.2.6 Soft strip is undertaken using a combination of hand and mechanical removal and sorting.

6.2.7 Hazardous waste will be kept in a quarantine area and will again consider any environmental issues associated with such. Such wastes may include smoke detectors, fluorescent light tubes, sharps, gas cylinders, etc.

6.2.8 Wastes will be regularly exported to a suitably licensed recycling or disposal facility. Full Duty of Care / Consignment notes will be maintained on site and will be included in the final completion report.

6.2.9 In accordance with CDM Regulations, detailed task specific health & safety Risk Assessments and Method Statements will be prepared as necessary and disseminated to all operatives / interested parties.

6.2.10 Non licensed asbestos which primarily consists of cement bonded asbestos but also some internal cladding and ceiling and floor tiles, and hereafter referred to as asbestos containing materials (ACM's) will be removed following soft strip, to prevent cross contamination of potential recyclates.

It shall be removed by suitably trained and experienced operatives using hand tools. An exclusion zone shall be established around buildings where ACM's are being removed and only operatives specifically tasked with ACM's removal works and who will wear additional PPE as required, will be allowed entry into these areas.

- 6.2.11 A suitable water supply shall be identified and a method of keeping working areas damp (not saturated) during ACM's removal shall be established; likely to be hoses.
- 6.2.12 Every effort will be made to ensure ACM's are not broken during removal or loading. Working areas shall be kept clean at all times and ACM's will not be mixed with other wastes (unless it is unsafe to separate).
- 6.2.13 High level ACM's will be removed by operatives working from scissor lifts or other methodology deemed suitable.
- 6.2.14 Small, loose fragments of ACM's will be double bagged in asbestos bags and placed in an asbestos skip. As soon as reasonably practicable, other ACM's will be carefully placed into asbestos skips.
- 6.2.15 ACM's will be regularly exported to a suitably licensed disposal facility. Consignment notes will be maintained on site and will be included in the final completion report.
- 6.2.16 Following soft strip and removal of ACM's, the building will be demolished using various mechanical plant primarily consisting of demolition specification 360<sup>0</sup> excavators, fitted with specialist attachments. This will avoid personnel working at heights wherever possible and will minimise the generation of noise and dust, as works can be undertaken in a controlled and methodical manner.
- 6.2.17 An exclusion zone will be established around buildings prior to commencing demolition. An inspection of the exclusion zone shall be undertaken prior to re-commencing demolition after breaks, or at the beginning of the working day.
- 6.2.18 Materials will be separated as works progress into various streams such as brick for crushing, concrete for crushing, metal for recycling, wood for recycling and other wastes for disposal.



6.2.19 The various streams will either be loaded onto dumpers for transport to local processing areas (more detail on this later) or stockpiled prior to offsite disposal.

6.2.20 Water dispensed by bowsers or hoses will be utilised to prevent fugitive dusts.

### **6.3 Demolition of Hardstandings & Foundations**

6.3.1 Demolition of hardstandings, foundations, obstructions and roads (hereafter referred to as hardstandings) will be undertaken in a phased manner in accordance with a phasing plan to be agreed with the client. It is proposed to use existing roads and certain areas of hardstandings for various uses (further detail later on this) so phasing of demolition of hardstandings may not necessarily follow that of above ground demolition.

6.3.2 Subject to other phasing requirements, AST's, UST's and known areas of ground contamination will be targeted first. Further detail on tank de-commissioning and remediation is provided later in this document.

6.3.3 Hardstandings will be broken out with a hydraulic breaker or lifted by 360<sup>0</sup> excavator. Larger areas of good condition asphalt may also be planed to facilitate better recycling of such. Materials will be transported to local processing areas. If unforeseen areas of contamination, services or UST's are identified beneath the hardstandings, then work shall be suspended in that area until an Environmental Engineer has inspected the area and agreed an appropriate action plan. Where necessary, this will also entail discussions with Waterman.

6.3.4 Due to the size of the site and constraints imposed by existing roads and services, a single processing area is neither sustainable (would entail excessive haulage distances and create unacceptably large stockpiles) nor cost effective, so it is proposed to establish local processing and stockpiling locations in various areas around the site which shall be agreed with the client. This will also ensure that when the resultant recycled aggregate is used in the subsequent construction activities, it will be available at discrete locations across the development, thus avoiding excessive haulage distances. In agreeing the exact locations of the processing and stockpiling areas, we shall avoid establishing near sensitive site neighbours or environmental receptors.

6.3.5 Concrete / brick shall be kept separate from asphalt, but the method of processing and stockpiling shall be the same for both.

Recycled aggregate produced by demolition activities will be utilised in the subsequent redevelopment of the site. Recycled aggregate produced from brick / concrete will be used wherever specification of construction products allow. Recycled aggregate produced from asphalt materials will only be used beneath produced roads or other hardstandings. This shall significantly reduce the environmental impact and financial costs of both exporting recycled aggregate and importing construction materials. It is most likely that these works will produce far more recycled aggregate than subsequent redevelopment will require. Therefore, some materials will be exported to other local development projects.

- 6.3.6 Demolition materials will be transported to local processing areas. Location of these areas shall be established so as to minimise transportation and ensure they are positioned away from sensitive receptors, i.e., occupied premises and water courses.
- 6.3.7 Processing areas will receive demolition materials via dump truck. Materials will then be loaded into mobile crushing unit(s), although some materials may require pre-processing using hydraulic breakers (large stanchion bases or similar). Materials will generally be crushed at a location where stockpiles shall remain. Subject to the client's exact requirements, additional screening / blending may be undertaken to produce a wide range of recycled aggregates for subsequent construction.
- 6.3.8 Crushers will be fitted with dust suppression equipment normally consisting of a spray bar fitted directly to the crusher, although additional water may also be applied direct to stockpiles.

#### **6.4 Tank & Pipework De-commissioning**

- 6.4.1 The client has undertaken a significant and comprehensive survey of above ground storage tanks (AST's) and below ground storage tanks (UST's). This includes compiling a register of known tanks providing location, size, previous use, and quantity / quality of contents. Where tanks still contained liquids, it has been confirmed that this is exclusively either oily water or free product. These areas shall be prioritised as part of the hardstanding demolition works.
- 6.4.2 All tanks shall be decanted of any liquids. Product shall be recovered using specialist recovery pumps. Small quantities will be stored in appropriate drums, although larger volumes may be decanted using road going vacuum tankers to allow immediate transportation to a suitably licensed recycling facility.

Drums will be stored in a suitable area, which as a minimum shall be fenced and upon an impermeable surface within a bund of a minimum of 110% capacity of the volume contained therein. The drums shall be regularly exported to a suitably licensed recycling facility. Consignment notes will be maintained on site and included in the final completion report. A majority of liquids consist of oily water which will be removed by vacuum bowser / tanker for subsequent transport to our own temporary waste water treatment plant (WWTP). Further detail on the WWTP and disposal of treated water is provided later in this document.

- 6.4.3 Following removal of any liquids, tanks shall be inspected, cleaned and de-gassed as necessary. For larger tanks this may entail manned entry. If required, manned entry will be undertaken by appropriately qualified operatives only. Full task specific Risk Assessments and Method Statements for this activity are outside the scope of this document. Washings from tank cleaning will be handled as oily water.
- 6.4.4 If gaskets are present on the tanks, samples shall be obtained to confirm whether asbestos is present. In the event that asbestos gaskets are present, they shall be removed by a suitably competent person and disposed of at a suitably licensed facility.
- 6.4.5 Pipework connected to tanks will be traced / exposed until a free end is found. If a free end is not found or the pipe needs to be broken first, then it shall be assumed the pipe potentially contains contaminated liquids. Access into the pipe work will be via existing flanges or fixing a saddle with a tapping arrangement. In any event, during all initial entry works into the pipework, full emergency and contingency arrangements will be in place to deal with localised spillages, and / or immediately re-seal the pipe. Arrangements may include any combination of the following, although emergency measures will always be in place:
- (i) The saddle and tapping arrangement will allow water to be drained and collected safely for immediate collection into a vacuum tanker.
  - (ii) An appropriate sized receptacle to catch water as it drains from the pipe which can then be immediately pumped to nearby storage or transport to the treatment plant.
  - (iii) A suitable impermeable liner placed beneath the flange / pipe to catch small spillages.
  - (iv) No initial entry into the pipework system undertaken adjacent to sensitive receptors, i.e., surface water, foul water drainage systems, etc.
  - (v) Ensuring adequate emergency equipment is always adjacent such as plugs and cap ends, secondary pumps, temporary storage, pads, booms and other absorbents.

Liquids recovered from pipework will be handled as described for that found in tanks.

- 6.4.6 Following cleaning and de-gassing as necessary, AST's will either be exported whole, crushed prior to placing in a skip, or cold cut using shears fitted to the demolition excavator.
- 6.4.7 UST's will be fully exposed by breaking out overlying hardstandings and surrounding soils (further detail is provided later on the management of soils surrounding tanks). This will include chasing out any connecting pipework and all connected and associated infrastructure.
- 6.4.8 UST's will be removed using appropriately sized excavators and crushed or cut as described for AST's to facilitate transportation. Pipework will be pulled in a similar way. Materials will then be exported to a suitably licensed recycling facility.
- 6.4.9 All tank areas will be treated as potential TPH hotspots and assessed. Further detail is provided on this later.
- 6.4.10 The WWTP will be constructed at a suitable location, i.e., away from sensitive receptors and within distance of a manhole on the foul sewer. It will typically consist of suspended solid removal, oil / water separator and granulated activated carbon. If necessary, a volatile air stripper can be added to deal with any volatiles that may be present. It will be constructed upon an impermeable base or liner and surrounded by a bund. A typical schematic of a temporary WWTP is enclosed at **Appendix A**.

## **6.5 Remediation**

- 6.5.1 Site investigations and subsequent Risk Assessments by Waterman have confirmed the following remediation objectives. Ongoing sources of contamination from historic tanks and associated pipework is addressed in previous sections:
- (i) Localised TPH contamination within made ground.
  - (ii) Localised TPH contamination in perched groundwater including LNAPL.
  - (iii) Localised contamination within the made ground associated with heavy metals and / or PAH's.
- 6.5.2 Localised TPH contamination is present within the made ground primarily directly surrounding former tanks. Drawing D3035\_12B enclosed at **Appendix A** identifies known tank locations.

- 6.5.3 Following demolition and tank removal, known or newly identified TPH hotspots will be excavated under the supervision of an experienced Environmental Engineer. The hotspot shall centre on the SI location and / or former tank location. Excavation shall extend horizontally until such time the Environmental Engineer believes soils, aided by the use of a PID, are free from visual and olfactory evidence of contamination beyond site specific target levels. At this time, a validation sample shall be obtained from the sides of the excavation. In the event that the validation sample fails, further soils shall be removed from the offending side(s) and a new validation sample obtained. This shall be repeated until an appropriate validation sample has been obtained or further excavation is constrained.
- 6.5.4 Horizontal excavation will be considered constrained at the site boundary, or if an obstruction is present such as existing services, building, protected tree or similar. Where a validation sample fails and further excavation is not possible, further discussions shall be held with Waterman in the first instance and an appropriate action plan agreed. This is likely to include further Risk Assessment on residual contamination considering contaminant type, concentration, immediate geology, nature of constraint preventing further excavation and source-pathway-receptor linkages. If the final action plan is to leave contamination in-situ, details shall be submitted to the appropriate regulators for comment / approval.
- 6.5.5 The site currently consists of either hardstandings underlain by made ground or soft areas containing topsoil overlying made ground. The made ground is underlain by bedrock typically 0.5 – 2mbgl. Depth of excavation for TPH hotspots shall extend either to when bedrock is encountered, 3mbgl or a compliant validation sample is obtained, whichever is encountered first. Vertical excavation may be constrained by existing services although most likely, bedrock. The bedrock is typically described as thickly bedded limestone or densely packed limestone cobbles at commencement, silty / clayey mudstone, silty / sandy mudstone, pale grey siltstone or coarse grained sandstone. For excavation purposes, bedrock shall be defined as that which cannot be excavated without specialist breaking plant and confirmed by Waterman.
- 6.5.6 The rationale for depth of excavation for TPH can be explained as follows. Whilst the bedrock may be fissured in places, it is unlikely that significant TPH contamination would have penetrated. This is supported by the general absence of evidence of significant TPH contamination from groundwater monitoring and the conclusions of the DQRA which confirms groundwater remediation is not necessary.

Furthermore, where TPH has penetrated the bedrock, there are no practicable methodologies available which do not entail excessive costs, to remove or treat the contamination, especially where impacted bed rock is present within the vadose zone. Breaking rock is slow, creates excessive noise and vibration and uses significant amounts of fuel. In-situ methodologies would not be effective on this site due to the permeability of the rock and the low water table, which would both inhibit product / vapour recovery or movement of oxidants. It is considered that the betterment achieved through removal of primary sources of contamination (tanks and contaminated liquids contained therein) and secondary sources (TPH in soils and or perched groundwater and / or recovery of LNAPL, if present) will ensure that natural degradation and dilution of the low levels of deeper TPH contamination will continue to decrease over time.

- 6.5.7 In the event that TPH contamination in made ground extends beyond 3mbgl, it is unlikely that the additional environmental impact and cost of further excavation would achieve significant benefit. Excavation beyond this depth may well require temporary works (earthwork support) which would require additional specialist plant and materials to be transported to and from site. Notwithstanding the aforementioned, in the event that made ground or natural soils (not consolidated rock) containing TPH above the SSTL's is still present (as defined by obtaining a single validation sample from the base) at depths greater than 3mbgl, further discussions shall be held with Waterman in the first instance and an appropriate action plan agreed. This is likely to include further Risk Assessment on residual contamination considering contaminant type, concentration, immediate geology, nature of constraint preventing further excavation and source-pathway-receptor linkages. If the final action plan is to leave contamination in-situ, details shall be submitted to the appropriate regulators for comment / approval.
- 6.5.8 All soils in and around former tanks will be assessed for visual and olfactory evidence of TPH contamination, aided by the use of a PID. If there is any visual or olfactory evidence of contamination, a verification sample will be taken consisting of a composite sample of five sub samples collected from the sides and base of the former tank void to confirm the absence of TPH contamination above the SSTL's and to provide appropriate evidence for the completion and validation report. One composite sample shall be collected per 15m<sup>2</sup> of exposed surface area.

- 6.5.9 For previously identified TPH hotspots or where soils surrounding former tanks or pipework exhibit either visual or olfactory evidence of TPH contamination thought to be above the SSTL's, soils will be excavated under the supervision of a suitably qualified Environmental Engineer. Soils will be exported to the treatment area (further detail is provided on this later). Whilst some evidence of TPH contamination may be present in-situ, the Environmental Engineer may deem it sufficiently low that he / she considers it to be below the SSTL's. In this case, validation samples as described later shall be taken. If the validation samples fail, then soils will be excavated for treatment from the offending base and / or side(s).
- 6.5.10 Any free product (LNAPL) or contaminated groundwater found in excavations or former tank voids will be collected, treated and disposed of, as per the tank water. It is worthy of note that very little perched groundwater was encountered during the site investigations. At this time, no excavation is likely to extend to the groundwater proper, although some of the deeper tank installations may be positioned within the groundwater.

## **6.6 TPH Soil Treatment**

- 6.6.1 Soils impacted with TPH and to a lesser degree PAH, will be transported to a treatment area for treatment via ex-situ bioremediation. The Environmental Engineer may deem the level of TPH contamination to be marginal (based on visual and olfactory evidence and the use of a PID) and may decide to obtain a  $T_0$  sample whilst soils are still in-situ or after being placed in stockpile prior to any treatment.
- 6.6.2 The treatment area will be constructed in compliance with our deployment form, (which is subject to approval from the Environment Agency) but as a minimum will be constructed on an impermeable base with bunding around. The impermeable base will either be an appropriate geomembrane or an area of existing concrete hardstanding. Where membrane is used, it will be suitable for use with TPH. Where existing concrete hardstanding is used, it will only be upon hardstanding destined for demolition. It will be inspected and any existing cracks, gullies or drains will be filled or repaired. A low concrete bund will be constructed around the treatment area to prevent run off. A collection sump will collect any run off from contaminated stockpiles and treatment windrows. Runoff will be treated and disposed of as described for tank water. Treatment areas will not be constructed adjacent to boundaries with sensitive neighbours, i.e., occupied residential or commercial premises or surface waters.

- 6.6.3 All soils destined for treatment will first undergo pre-treatment if required. Pre-treatment will consist of physical screening via appropriate mechanical screening plant which will remove oversize (hard) materials for subsequent recycling, remove other 'waste' materials not suitable for treatment or re-use, break up clump forming soils such as clay, and generally create a more homogenous soil mass better suited to bioremediation treatment. It will also allow the soil mass to become properly aerated and improve soil structure.
- 6.6.4 Following screening, TPH impacted soils will be formed into windrows. T<sub>0</sub> samples shall be taken, together with any other testing deemed necessary to confirm the suitability and adjustments required to optimise bioremediation. Adjustments may include but not be limited to, moisture and nutrient content. It is not expected that assessment or adjustment of natural cultural environments or, the addition of substrate will be required at this time, but this shall be reviewed based on treatment performance. Further sampling shall be undertaken during the treatment period to monitor the efficiency of the treatment and may only monitor certain parameters, i.e., total petroleum hydrocarbons rather than speciated. Final validation will be to the full required suite.
- 6.6.5 Soils formed into windrows will be regularly turned to maintain the efficiency of the bioremediation process. Covers will be applied / removed as necessary to manage environmental impact and the efficiency of the bioremediation.
- 6.6.6 Once windrows have achieved the SSTL's they will then be suitable for re-use in the reinstatement works beneath the pathway break.
- 6.6.7 A typical schematic of a windrow construction is enclosed at **Appendix A**.
- 6.6.8 Former locations of large obstructions, UST's or hotspots will be surveyed and recorded on a final as-built drawing. Large shall be defined as leaving a void greater than 1.5m deep and / or 9m<sup>2</sup>.

## **6.7 Other Soil Contamination**

- 6.7.1 Elevated heavy metals, semi metals and PAH's have been identified sporadically across the site within the made ground, albeit at relatively low concentrations. These will be addressed via a pathway break approach as described previously.



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- 6.7.2 The pathway break for the site will consist of construction (roads, pavements, building floor slabs, etc.) or 600mm of certified sub soil and top soil in proposed public open spaces (POS) and private gardens. Validation of the pathway break in POS and gardens is detailed later in this document.
- 6.7.3 As part of the demolition and general site clearance works, some earthworks re-profiling will be undertaken to establish appropriate site formation levels for subsequent construction. As the exact layout and setting out of the proposed new development falls outside the scope of these works, all works associated with the installation of the pathway break and validation of such, fall outside the scope of these proposed works. However, detail of how this will be managed is included within this document at Section 11 for completeness.
- 6.7.4 We have provided a post demolition / remediation conceptual model to demonstrate the pathway break scenarios in drawing D3035\_14 enclosed at **Appendix A**.

## **7 Reinstatement & Materials Recycling**

- 7.1 Demolition and site clearance works will entail the removal of all hardstandings as previously described and the removal and stockpiling of topsoils removed from existing areas of soft landscaping and gardens. At this stage, whilst the exact layout of the proposed redevelopment will be subject to minor change, development levels will generally remain the same, i.e., there is no need to undertake large scale re-profiling, although some local re-profiling is likely.
- 7.2 Recycled aggregate produced by the demolition works will be stockpiled for subsequent reuse or export. Soils cleared from existing soft areas or any minor re-profiling will be stockpiled and sampled. Based on the results of validation sampling, stockpiled soils will fall into one of three categories;
- (i) suitable for reuse within the pathway break,
  - (ii) suitable for use beneath the pathway break without treatment or,
  - (iii) suitable for use beneath the pathway break after treatment.
- 7.3 Reinstatement works will utilise site won materials used in accordance with either the WRAP Quality Protocol or CL:AIRE The Definition of Waste: Development Industry Code of Practice. VertaseFLI will reinstate all hotspot and tank voids created by these works. Tank and hotspot voids will be reinstated using either site won recycled aggregate or site won compliant soils. Materials will be compacted in accordance with the Highways Specification and as dictated by classification testing of such materials and the specification as detailed in the Waterman Remediation Strategy.
- 7.4 Where required, re-profiling will use site won soils which have been previously classified and validated.
- 7.5 At this stage, exact formation levels for the proposed redevelopment have not been defined, although as previously stated, are unlikely to change much from existing. Unless re-profiling earthworks are required, VertaseFLI will leave the site typically 200mm – 300mm below existing site levels.
- 7.6 Follow on trades employed for construction will undertake further re-profiling for construction purposes. This will need to consider the final installation and validation of the pathway break. Where buildings, roads and other hardstandings are constructed, no further consideration is required as the construction will constitute the pathway break.

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For gardens and POS areas, in-situ soils will require validation at the surface or, excavation to establish a level 600mm below final levels followed by reinstatement with certified sub soils and topsoils.

- 7.7 Whilst some stockpiled recycled aggregate and soils will be used in the remediation works, a majority will be left in stockpile for reuse during subsequent construction works, although initial calculations show there will be a surplus of recycled aggregate produced from the demolition works. Surplus material will be exported from site for use in local construction projects and will be a valuable local source of recycled materials, thus avoiding the need to use primary aggregates from quarries.
- 7.8 There are infrequent materials such as tiles and bricks that may have a market value as reclaimed building products. Where these are identified, they will be carefully removed prior to mechanical demolition and sorted ready for export.
- 7.9 Metal and clean wood as a minimum, will be exported to suitably licensed recycling facilities. Vegetation and trees cleared as part of these works will be shredded and wherever possible, used as a mulch / topsoil improver or to create wildlife rich habitats (logs).

## 8 Validation

8.1 Validation requirements can be summarised as follows:

- (i) Validation of hotspot / tank voids.
- (ii) Validation of TPH impacted soils after treatment.
- (iv) Testing of treated tank / perched groundwater after treatment.
- (v) Validation of soils for reuse.

8.2 Recycled aggregate will be constantly monitored and inspected for visual and olfactory evidence of contamination. Recycled aggregate will undergo testing for geotechnical classification for material used to fill excavations in accordance with Table 6/1 of the Highways Agency Series 600 'Earthworks' Specification for Highway Works, and will have the written approval of the Environmental Consultant. For material to be reused as back fill for voids during these works, geotechnical testing shall be at a frequency of one sample per 500m<sup>3</sup> and shall achieve a maximum dry density of at least 95% for a 2.5kg rammer, and a maximum air void of 10%. Appropriate in-situ tests (e.g., plate bearing tests, sand replacement tests or use of a Nuclear Density Meter) will be undertaken to demonstrate the compaction requirements are being met. Exact specification of the in-situ testing will be agreed with Waterman prior to any reuse. The fraction of organic material will also be in accordance with the relevant highways specification. In-situ testing is to be undertaken at an initial frequency of not less than every second backfilled layer and not less than two locations per excavation, per layer. Where backfilling below saturated zone is undertaken, the material will meet Class 6A, selected granular fill.

8.3 Hotspot / tank voids shall be sampled and validated. A verification sample will consist of a composite sample of five sub samples collected from the sides of the former tank void to confirm the absence of TPH contamination above the SSTL's and provide appropriate evidence for the completion and validation report. One composite sample shall be collected per 15m<sup>2</sup> of exposed surface area. Verification suite and target concentrations shall be as detailed in Tables B2 or B3 depending on their location and proximity to the site boundary. Should any side validation sample fail, then further materials will be removed until such time that a compliant validation sample is obtained or further excavation is constrained.

8.4 A verification sample consisting of a composite sample of five sub samples shall be collected from the base of the former tank void to confirm the absence of TPH contamination above the SSTL's and provide appropriate evidence for the completion and validation report.

One composite sample shall be collected per 15m<sup>2</sup> of exposed surface area. Verification suite and target concentrations shall be as detailed in Tables B2 or B3 depending on their location and proximity to the site boundary. Should any basal validation sample fail, then further materials will be removed until such time that a compliant validation sample is obtained, bedrock is encountered or the base of excavation exceeds 3mbgl. Rationale is detailed in section 6.5. Verification samples cannot be obtained from consolidated bedrock. Where the base is situated atop the consolidated bedrock, a visual and olfactory inspection and record shall be made.

8.5 Validation samples on soils following bioremediation treatment shall be sampled; one per 500m<sup>3</sup>. Validation suite and compliance criteria shall be as detailed in Table B2 or B3 depending on where the soils will be reused in consideration of the distance from the site boundary.

**Table B2** - Validation criteria for hotspot voids and materials for reuse within the unsaturated zone less than 250m from site boundary beneath the pathway break.

Contaminant	Target Concentration (mg / kg)
Aliphatic C8-C10	80
Aliphatic C10-C12	1,000
Aliphatic C12-C16	1,000
Aliphatic C16-C21	1,000
Aliphatic C21-C35	1,000
Aromatic C10-C12	7
Aromatic C12-C16	120
Aromatic C16-C21	440
Aromatic C21-C35	1,000

The above table excludes tanks UGNSA 04, 05, 06 & 07 which will only be reinstated with recycled aggregate.

**Table B3** - Validation criteria for hotspot voids and materials for reuse within the unsaturated zone more than 250m from site boundary beneath the pathway break.

Contaminant	Target Concentration (mg / kg)
Aliphatic C8-C10	240
Aliphatic C10-C12	1000
Aliphatic C12-C16	1000
Aliphatic C16-C21	1000
Aliphatic C21-C35	1000
Aromatic C10-C12	23
Aromatic C12-C16	1000
Aromatic C16-C21	1000
Aromatic C21-C35	1000

The above table excludes tanks UGNSA 04, 05, 06 & 07 which will only be reinstated with recycled aggregate.

8.6 Validation criteria for soils reused within the saturated layer shall comply with table B4 and be geotechnically suitable.

**Table B4** - Validation Criteria for soils reused within the saturated zone\*

Contaminant	Units	Target Concentration
pH (Acid)		5.5
pH (Alkaline)		9.5
Acrylamide	µg/l	0.1
Antimony	µg/l	5
Arsenic	µg/l	10
Barium	µg/l	1000
Calcium	mg/l	250
Cadmium	µg/l	5
Chloride	mg/l	250
Chromium	µg/l	50
Iron	µg/l	200
Lead	µg/l	10
Magnesium	mg/l	50
Manganese	µg/l	50
Mercury	µg/l	1
Selenium	µg/l	10
Sodium	mg/l	200

Contaminant	Units	Target Concentration
Boron	µg/l	1000
Copper	µg/l	2000
Nickel	µg/l	20
Zinc	µg/l	5000
Sulphate	mg/l	250
Total/Complex Cyanide	µg/l	50
Ammonium (NH <sub>4</sub> <sup>+</sup> )	µg/l	500
Nitrate (as N <sub>03</sub> )	mg/l	50
Nitrite (as N <sub>02</sub> )	mg/l	0.5
TPH C5 – C12 (Dry Soils Analysis)	mg/kg	0.2
TPH C12 – C40 (Dry soils Analysis)	mg/kg	5
Hydrocarbons (dissolved/emulsions)	µg/l	10
Polyaromatic Hydrocarbons (PAH)	µg/l	0.1
Benzo(a)pyrene	µg/l	0.01
Phenol	µg/l	0.5
Tetrachloromethane	µg/l	3
Trichloroethene (TCE)	µg/l	10 (combined total)
Tetrachloroethene (PCE)		
Trihalomethanes	µg/l	100
Vinyl chloride	µg/l	0.5
Benzene	µg/l	1
Ethyl Benzene	µg/l	NV
Toluene	µg/l	NV
Xylene	µg/l	NV
Sulphide	mg/l	150

\*Soils only not recycled aggregate

- 8.7 Validation of site won soils used within the pathway break shall be sampled and validated. Validation samples shall be taken at a frequency of one per 500m<sup>3</sup> prior to reuse. Validation suite and compliance criteria shall be as detailed in Table B1. This validation applies to both soils reused or existing in-situ soils, should they fall within the upper 600mm beneath proposed POS and gardens.
- 8.8 In the event that additional topsoil needs to be imported, it shall be sampled and validated at a frequency of one per 250m<sup>3</sup> per source. Validation suite and compliance criteria shall be as detailed in Table B1 and B4.

8.9 Placement of soils in the pathway break falls outside the scope of these works and shall be reinstated by others following redevelopment, as is the norm. This will also need to confirm the depth of the pathway break.

**Table B1** - Validation Criteria for Soils in Pathway Break (top 600mm gardens and POS only) and reuse in the saturated zone

<b>Residential End Use</b>	<b>Units</b>			
<b>Soil Organic Matter</b>	<b>%</b>	<b>1</b>	<b>2.5</b>	<b>6</b>
Arsenic	mg/kg	32	32	32
Antimony	mg/kg	550	550	550
Barium	mg/kg	1300	1300	1300
Beryllium	mg/kg	51	51	51
Boron (Water Soluble)	mg/kg	291	291	291
Cadmium	mg/kg	10	10	10
Chromium (Total)	mg/kg	3000	3000	3000
Chromium (VI)	mg/kg	4.3	4.3	4.3
Cobalt	mg/kg	240	240	240
Copper	mg/kg	2330	2330	2330
Lead	mg/kg	450	450	450
Mercury	mg/kg	1	1	1
Molybdenum	mg/kg	670	670	670
Nickel	mg/kg	130	130	130
Selenium	mg/kg	350	350	350
Vanadium	mg/kg	75	75	75
Zinc	mg/kg	3750	3750	3750
Cyanide (Free)	mg/kg	26	26	26
Complex Cyanide	mg/kg	63000	63000	63000
Thiocyanate	mg/kg	230	230	230
Aliphatic EC5 - EC6	mg/kg	30	55	110
Aliphatic EC6 - EC8	mg/kg	73	160	370
Aliphatic EC8-EC10	mg/kg	19	46	110
Aliphatic EC10-EC12	mg/kg	93	230	540
Aliphatic EC12-EC16	mg/kg	740	1000	1000
Aliphatic EC16-EC35	mg/kg	1000	1000	1000
Aliphatic EC35-EC44	mg/kg	1000	1000	1000



<b>Residential End Use</b>	<b>Units</b>			
<b>Soil Organic Matter</b>	<b>%</b>	<b>1</b>	<b>2.5</b>	<b>6</b>
Aromatic C6-C7 (Benzene)	mg/kg	0.08	0.16	0.33
Aromatic C7-C8 (Toluene)	mg/kg	120	270	610
Aromatic C8-C10	mg/kg	27	65	151
Aromatic C10-C12	mg/kg	69	160	346
Aromatic C12-C16	mg/kg	140	310	593
Aromatic C16-C21	mg/kg	250	480	770
Aromatic C21-C35	mg/kg	890	1000	1000
Benzene	mg/kg	0.08	0.16	0.33
Toluene	mg/kg	120	270	610
Ethyl Benzene	mg/kg	65	150	350
Xylene - o	mg/kg	45	110	250
Xylene - m	mg/kg	44	100	240
Xylene - p	mg/kg	42	98	230
MTBE (Methyl tert-butyl ether)	mg/kg	49	84	160
Naphthalene	mg/kg	1.5	3.7	8.7
Acenaphthylene	mg/kg	170	400	850
Acenaphthene	mg/kg	210	480	1000
Fluorene	mg/kg	160	380	780
Phenanthrene	mg/kg	92	200	380
Anthracene	mg/kg	2300	4900	9200
Fluoranthene	mg/kg	260	460	670
Pyrene	mg/kg	560	1000	1600
Benzo(a)anthracene	mg/kg	3.1	4.7	5.9
Chrysene	mg/kg	6	8	9.3
Benzo(b)fluoranthene	mg/kg	5.6	6.5	7
Benzo(k)fluoranthene	mg/kg	8.5	9.6	10
Benzo(a)pyrene	mg/kg	0.83	0.94	1
Indeno(1,2,3-cd)pyrene	mg/kg	3.2	3.9	4.2
Di-benzo(a,h.)anthracene	mg/kg	0.76	0.86	0.9
Benzo(g,h,i.) Perylene	mg/kg	44	46	47
Phenols	mg/kg	210	390	420
Phenol	mg/kg	210	390	420
Total PCB's	mg/kg			8

- 8.10 Contaminated water treated in our own WWTP will be subjected to validation testing in order to demonstrate compliance with the temporary trade effluent discharge consent.
- 8.11 Ongoing groundwater and ground gas monitoring pre, during and post demolition and remediation works, will be the responsibility of Waterman. Exact requirements of such will be agreed with the regulators by Waterman.

## **9 Health & Safety, and Environmental Control**

### **9.1 Fencing / Security**

9.1.1 The site currently benefits from some perimeter fencing and security. However, fencing arrangements will be reviewed and supplemented where required. Additional task specific fencing will be utilised as necessary throughout the works, i.e., for establishing exclusion zones around individual buildings during asbestos removal and demolition. Fencing will also include suitable warning signs where necessary and will be regularly inspected and maintained throughout the project.

### **9.2 Health & Safety**

9.2.1 The works will require comprehensive controls and management to mitigate potential impacts. VertaseFLI operates an Integrated Management System in accordance with BSEN ISO9001, 14001 and 18001. The procedures and records contained therein ensure all works are carried out in a manner that minimises risks to health and safety and impact on the environment, and generates adequate and accurate records to demonstrate works have been undertaken to the required standard, and in accordance with all applicable legislation. All such records are collated on contract completion (or sooner as required) and included within the contract completion report. Appropriate progress reports will be provided in a format and at a frequency agreed with the client.

9.2.2 Works will be supervised by a suitably qualified and experienced site based manager at all times. We shall have specific technically qualified and operationally qualified personnel on site at all times. This includes direct and full supervision of any sub-contractors (asbestos and demolition) who will be employed. Specialist supervisors will also be responsible for direct day-to-day management of licensed asbestos and demolition works. VertaseFLI shall act as Principal Contractor and will be responsible for complying with CDM Regulations 2007. Waterman shall also have a resident engineer on site throughout the works.

9.2.3 VertaseFLI employs its own fully qualified Health & Safety Manager who will make regular and random visits to site. He will complete an inspection sheet including details of any actions required.

9.2.4 All staff and sub-contractors will be fully inducted, including ensuring training certificates etc. are up to date and relevant. Regular toolbox talks and site safety meetings will be held. Health & safety Risk Assessments and Method Statements will be produced for all necessary activities and disseminated to all appropriate personnel.

9.2.5 A Construction Phase Health & Safety Plan shall be prepared and reviewed throughout the project. Any accidents, incidents or near-misses will be recorded, reported and investigated as appropriate, including actions to prevent re-occurrence.

9.2.6 A traffic management plan will be prepared and reviewed throughout the project.

9.2.7 As detailed previously, a permit to work system in the guise of a PTP will be in place to ensure all risks are properly considered prior to commencing asbestos or demolition to individual buildings.

### **9.3 Environmental Controls**

9.3.1 The remediation works will be undertaken under an Environmental Permit. A site specific deployment form shall be produced and submitted to the Environment Agency National Permitting office for approval.

9.3.2 The works may generate noise above background levels, primarily from breaking of concrete hardstandings and foundations, and crushing operations. Noise mitigation measures will include, but are not limited to the following:

- Ensuring works are completed only within the permitted working hours.
- Positioning noisy items of plant such as crushers, away from boundaries with sensitive receptors.
- Use of modern and properly maintained mobile plant and tools.
- Restricting noisy operations to less sensitive times of day where possible.

9.3.3 Whilst the remediation works are unlikely to generate dust, the demolition works may. The Site Manager shall assess dust and its impact upon neighbours throughout the working day and ensure the following mitigation measures are being utilised to control dust:

- Enforcing speed limits of site traffic and using metalled roads and hardstandings whenever possible.
- Dust suppression via water applied by towed bowser.
- Suspending certain works in certain weather conditions.
- Covering stockpiles and windrows that may be contributing to dust.

9.3.4 Dust monitoring points shall be established at suitable locations around the activities with high potential to generate fugitive dusts. These shall consist of Frisbee sticky pads and / or a hand held dust monitor.

- 9.3.5 We do not believe the works will generate odours at concentrations that will be perceptible beyond the site boundary.
- 9.3.6 In the event that a complaint is made regarding noise, odour or dust from nearby residents, the Site Manager shall respond by attending the complainant's property if appropriate, to assess the nature of the complaint. This may include monitoring at that location. Mitigation measures as appropriate, shall then be enforced including if necessary, suspension of offending works until the prevailing weather conditions become more favourable. A full report will be prepared.
- 9.3.7 An Environmental Engineer will undertake all environmental monitoring. Full records shall be maintained and will be available for inspection at any time.
- 9.3.8 A comprehensive emergency plan shall be prepared. This will look to cover such eventualities as discovery of UXB, fire / explosion, emergency access into tanks, and spillage of fuel or contaminated water.

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## **10 Validation & Completion Report**

10.1 On completion of the works, a comprehensive completion report shall be prepared. This will include all the information as required by the contract specification including a full description of the works completed. Records contained therein will include, but not be limited to the following:

- (i) Drawing showing previous location of all tanks, TPH hotspots and any other major reinstated voids.
- (ii) Drawing showing location of validation sampling.
- (iii) Drawing showing location of residual stockpiles.
- (iv) Topographical survey drawing.
- (v) Copies of relevant regulatory correspondence.
- (vi) A record of all tanks removed.
- (vii) Air Quality Test Certificates following licensed asbestos removal.
- (viii) Locations of any residual services and hazards.
- (ix) All records relating to exports from site.
- (x) Final construction phase health & safety plan.
- (xi) Site Waste Management Plan.
- (xii) Verification report for the MMP.
- (xiii) Copies of geoenvironmental and geotechnical validation certificates.
- (xiv) Photographs.

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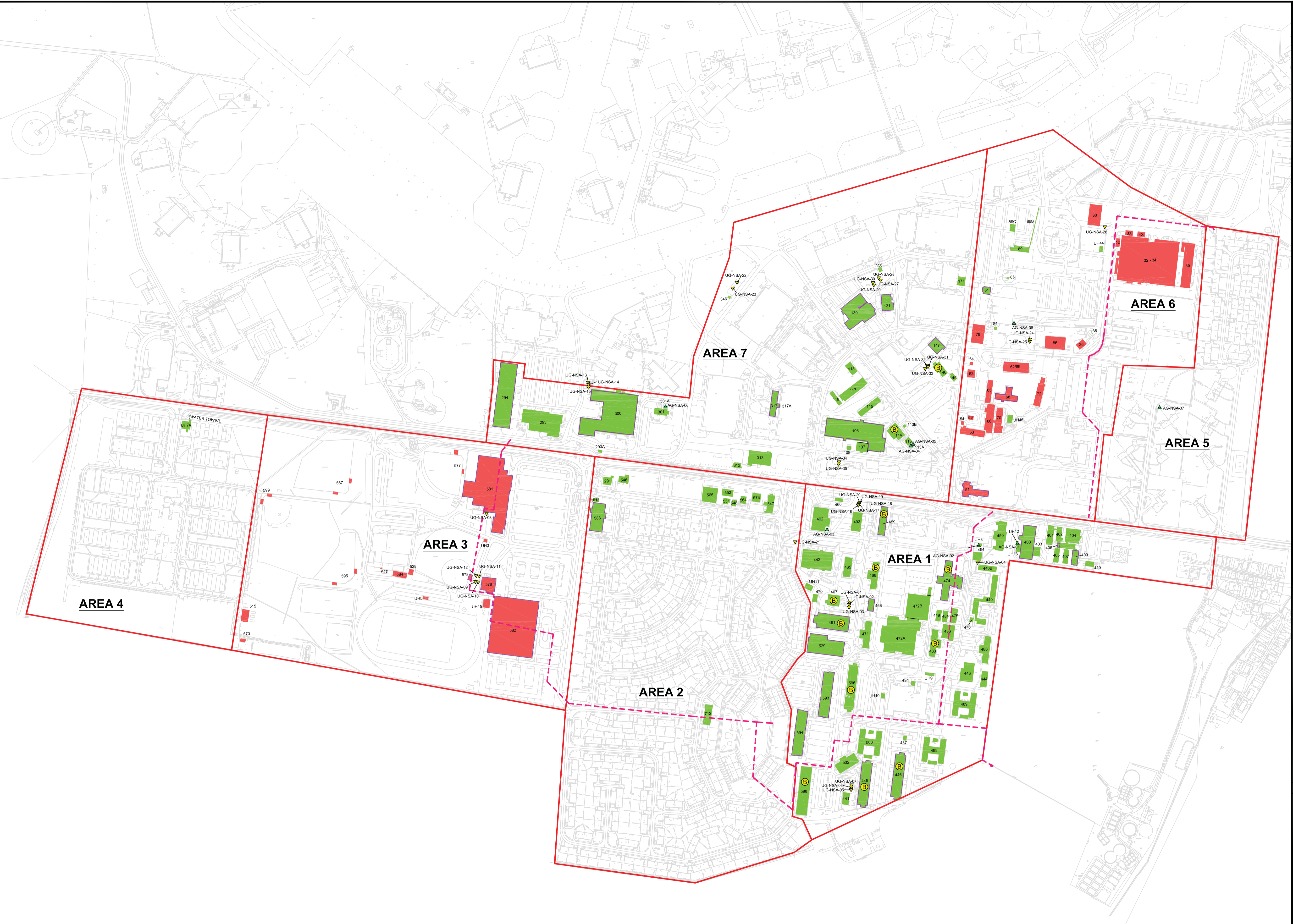
## **11 Post Remediation Requirements**

- 11.1 A number of remediation requirements can only be meaningfully completed as part of the construction design process or following construction. The following does not consider any requirements related to geotechnical or foundation design.
- 11.2 Due to the presence of made ground beneath the pathway break, proper consideration should be given to the type of pipes used for potable water. Final details and approval of such should be obtained from the appropriate water supply company prior to construction works.
- 11.3 Final assessment of the land gas characteristics of the site may need to be made following completion of the remediation works. Exact requirements should be agreed with the local planning authority and the NHBC.
- 11.4 As mentioned previously, placement of either all or some of the pathway break will be undertaken during and after construction. It will be necessary to validate the materials used in the pathway break including their depth. Exact details should be submitted to and approved by the local planning authority and the NHBC.

# Appendix A

## Drawings





- Legend**
- Area Boundary
  - Buildings To Be Demolished:
    - Phase-1
    - Phase-2
  - - - Proposed Foul Drain Run
  - WT Water Tower
  - Ⓟ Bats Present
  - ▭ Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI  
 Features and res. com boundaries.SI  
 & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
 AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
 UG-NSA-01 to 20

B	Phases Redefined	MRG	08-08-2012
A	Tanks Added	MRG	19-06-12
	FIRST ISSUE		13-03-12
Rev.	Description	Revised By	Date



- Bristol Head Office: Tel: 01275 397600 Fax: 01275 397601
  - Sheffield Office: Tel: 01246 813289 Fax: 01246 812983
  - Hertford Office: Tel: 01892 535757 Fax: 01892 535858
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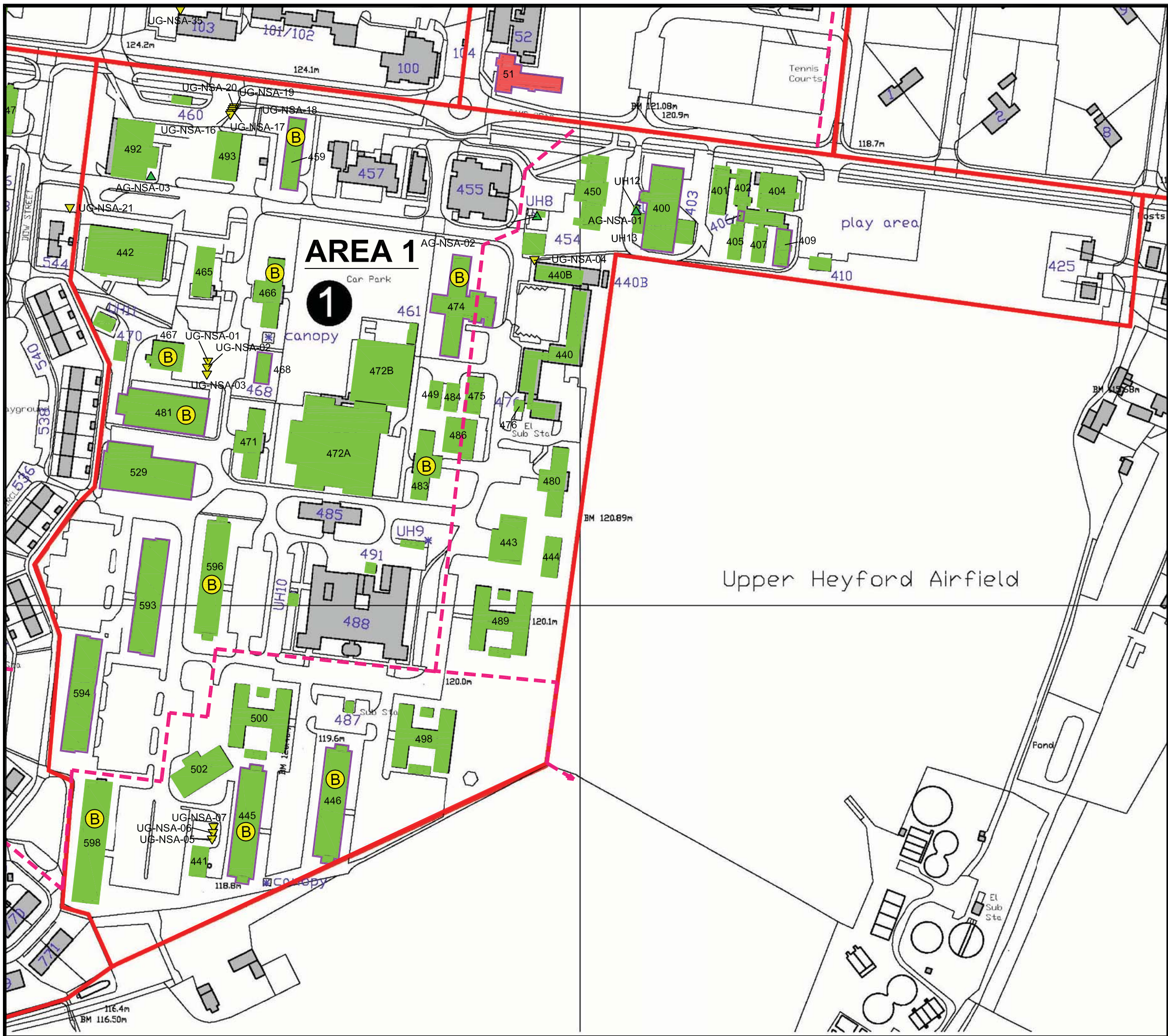
Site Address:  
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 Upper Heyford  
 Oxfordshire

Rev:  
**B**

Title: NSA Areas 1-7

Client: Heyford Park Settlements LP

Drawn: MRG	Checked: TT	Approved: ML
Dwg:D3035_12	Contract: 3035	Scale: 1:2500



**Legend**

- Area Boundary
- Buildings To Be Demolished:**
- Phase-1
- Phase-2
- Proposed Foul Drain Run
- WT Water Tower
- B Bats Present
- Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI Features and res\_com boundaries.pdf & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
UG-NSA-01 to 20

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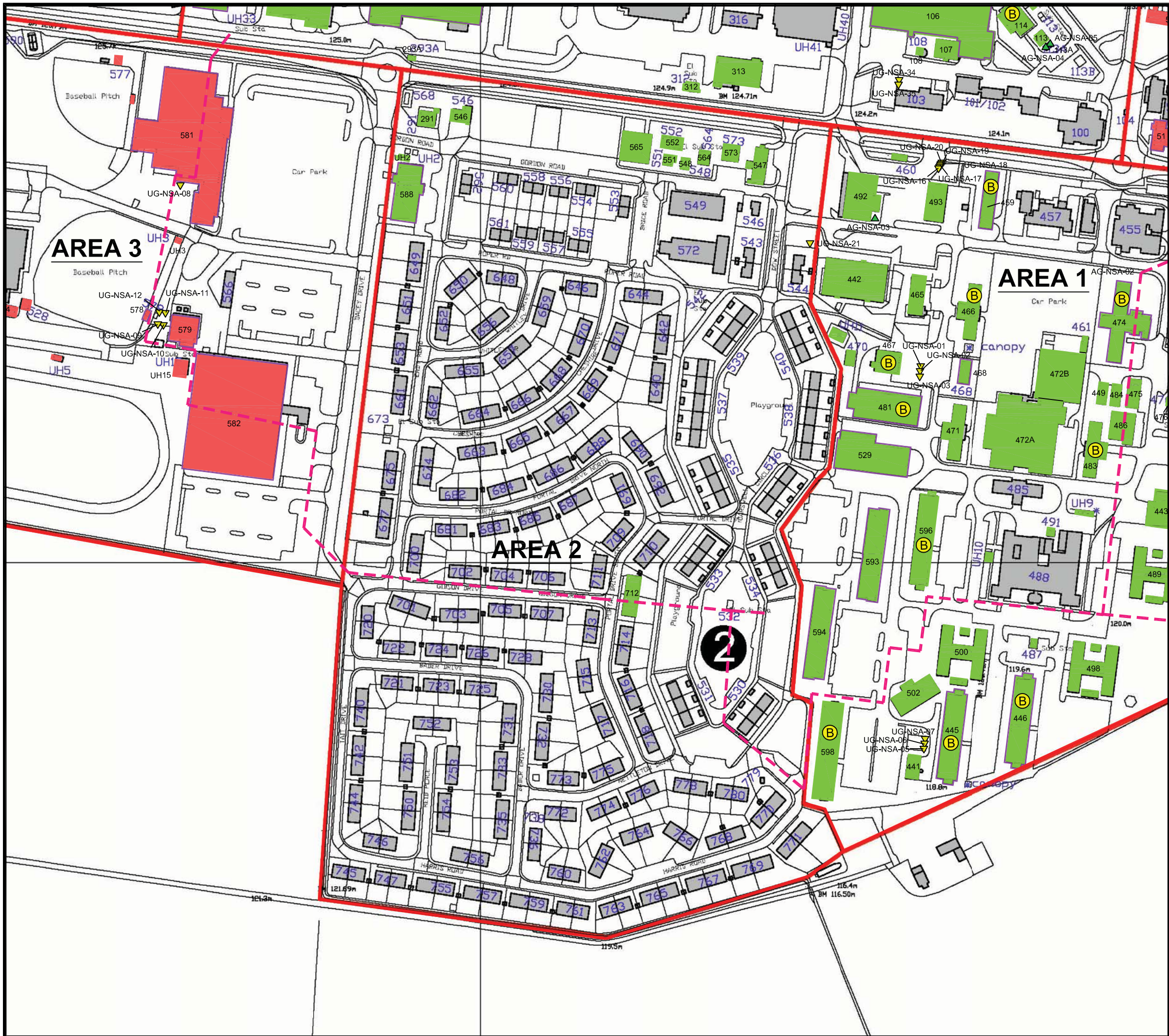
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Upper Heyford  
Oxfordshire

Title: NSA Area 1

Client: Heyford Park Settlements LP

Drawn: MRG	Checked: TT	Approved: ML
Dwg: D3035_12_1	Contract: 3035	Scale: 1:2000



- Legend**
- Area Boundary
  - Buildings To Be Demolished:**
  - Phase-1
  - Phase-2
  - Proposed Foul Drain Run
  - WT Water Tower
  - B Bats Present
  - Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI Features and res\_com boundaries.pdf & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
UG-NSA-01 to 20

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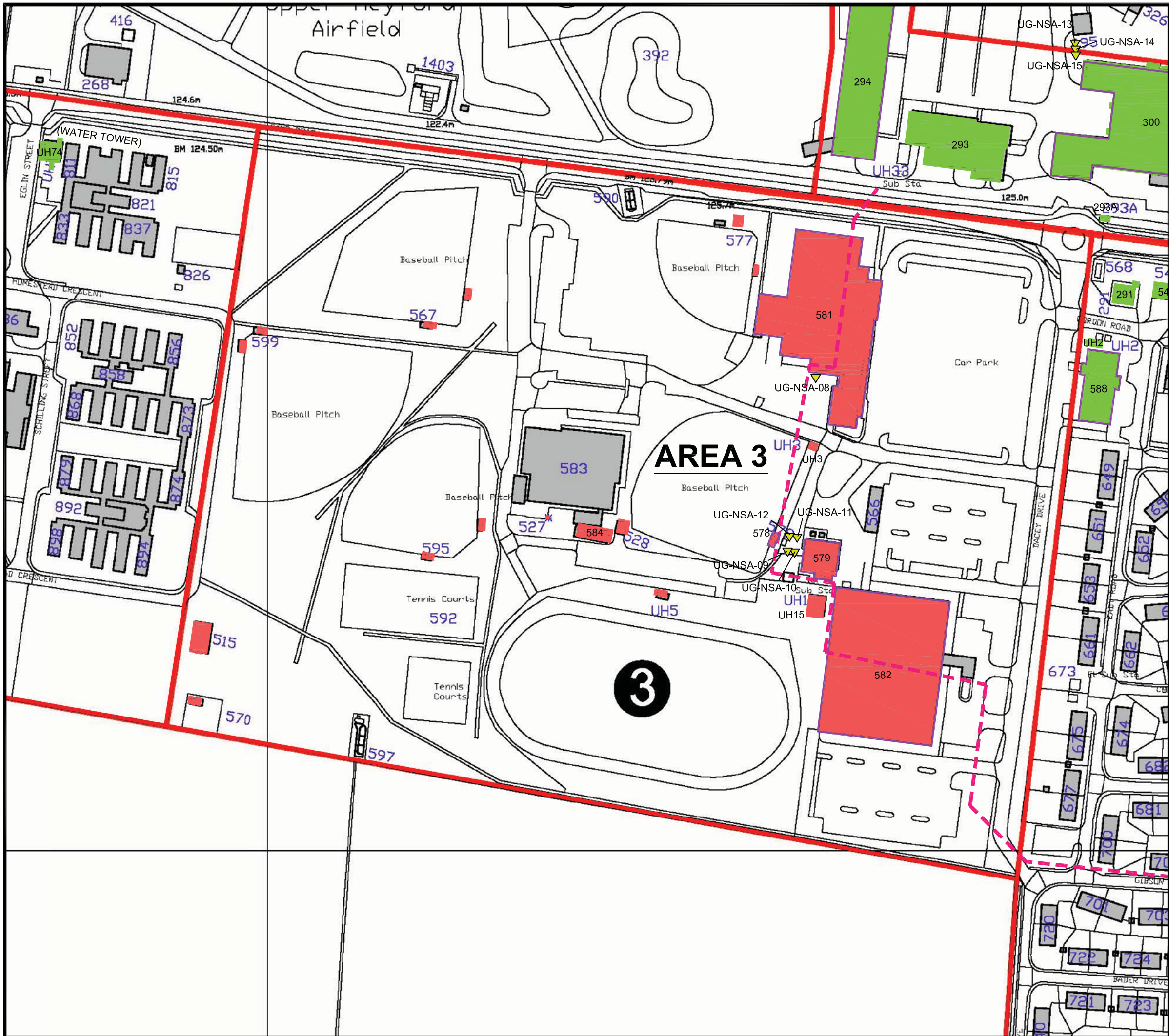
email: info@vertasefli.co.uk  
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Title: NSA Area 2

Client: Heyford Park Settlements LP

Drawn: MRG	Checked: TT	Approved: ML
Dwg: D3035_12_2	Contract: 3035	Scale: 1:2500



**Legend**

- Area Boundary
- Buildings To Be Demolished:**
- Phase-1
- Phase-2
- Proposed Foul Drain Run
- WT Water Tower
- B Bats Present
- Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI Features and res\_com boundaries.pdf & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
UG-NSA-01 to 20

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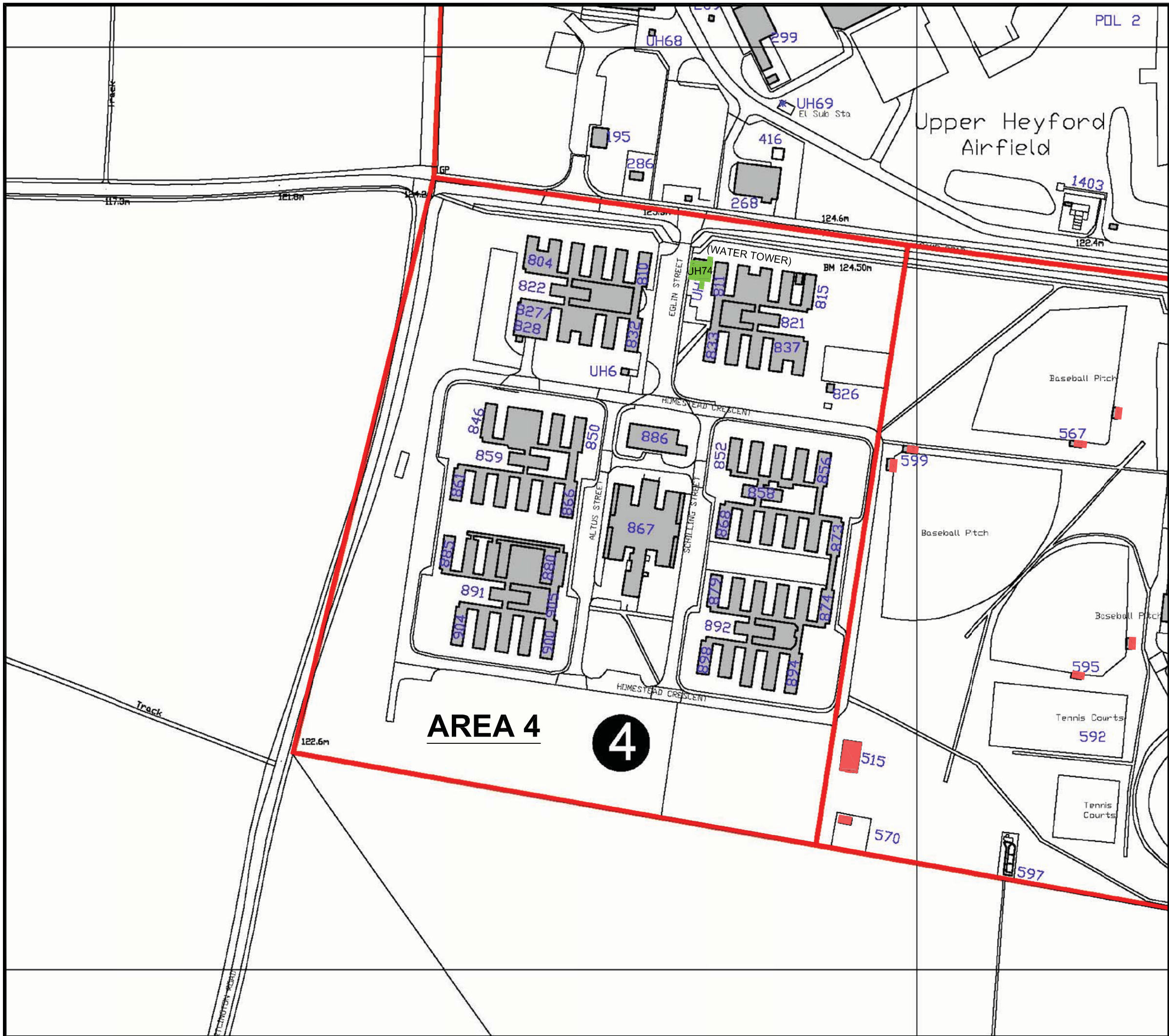
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Site Address:  
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Title: NSA Area 3

Client: Heyford Park Settlements LP

Drawn: MRG	Checked: TT	Approved: ML
Dwg: D3035_12_3	Contract: 3035	Scale: 1:2000



- Legend**
- Area Boundary
  - Buildings To Be Demolished:**
  - Phase-1
  - Phase-2
  - Proposed Foul Drain Run
  - WT Water Tower
  - B Bats Present
  - Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI Features and res\_com boundaries.pdf & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
UG-NSA-01 to 20

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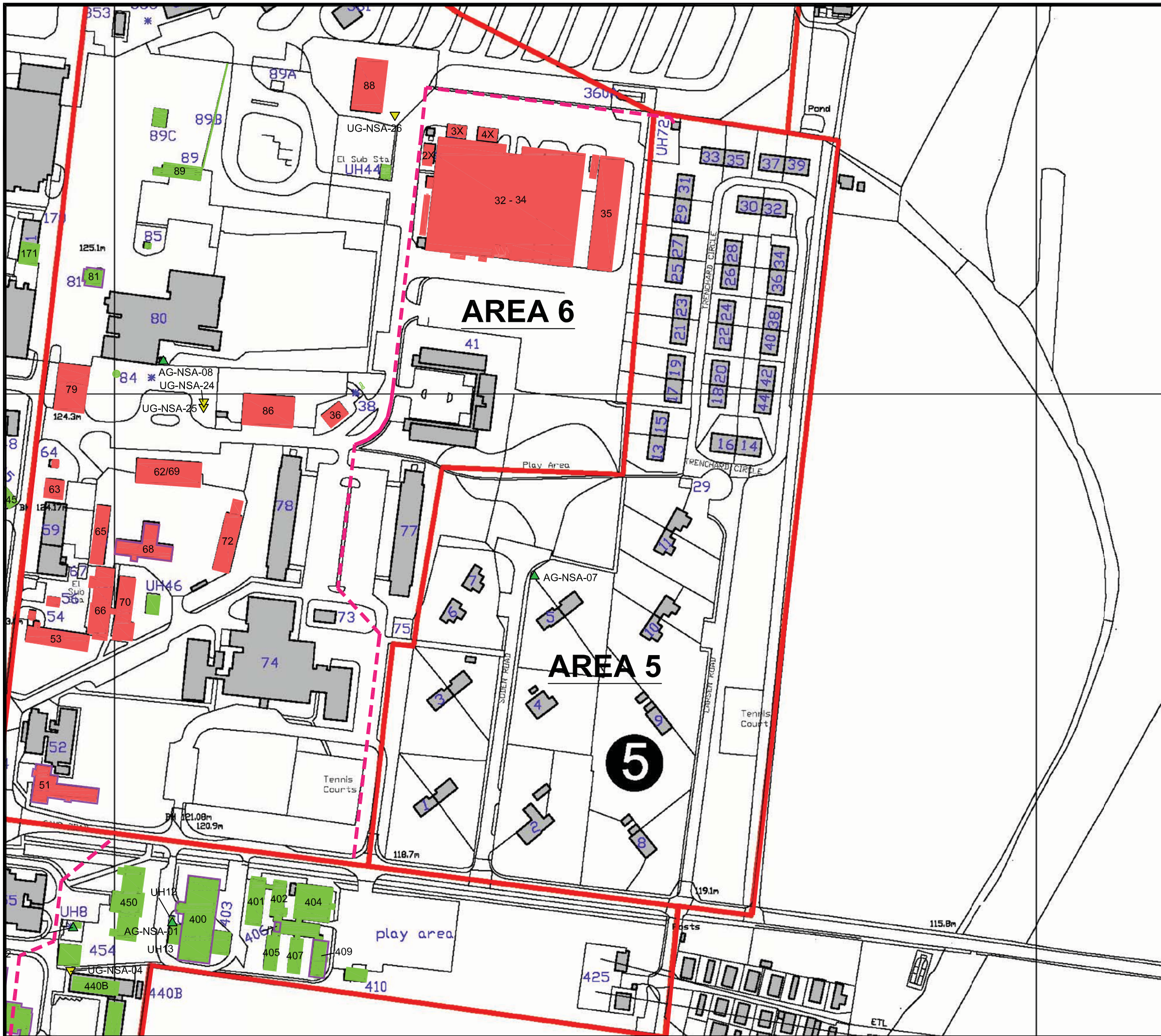
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Rev:

Title: NSA Area 4

Client: Heyford Park Settlements LP

Drawn: MRG	Checked: TT	Approved: ML
Dwg: D3035_12_4	Contract: 3035	Scale: 1:2000



- Legend**
- Area Boundary
  - Buildings To Be Demolished:**
  - Phase-1
  - Phase-2
  - Proposed Foul Drain Run
  - WT Water Tower
  - Bats Present
  - Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI Features and res\_com boundaries.pdf & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
UG-NSA-01 to 20

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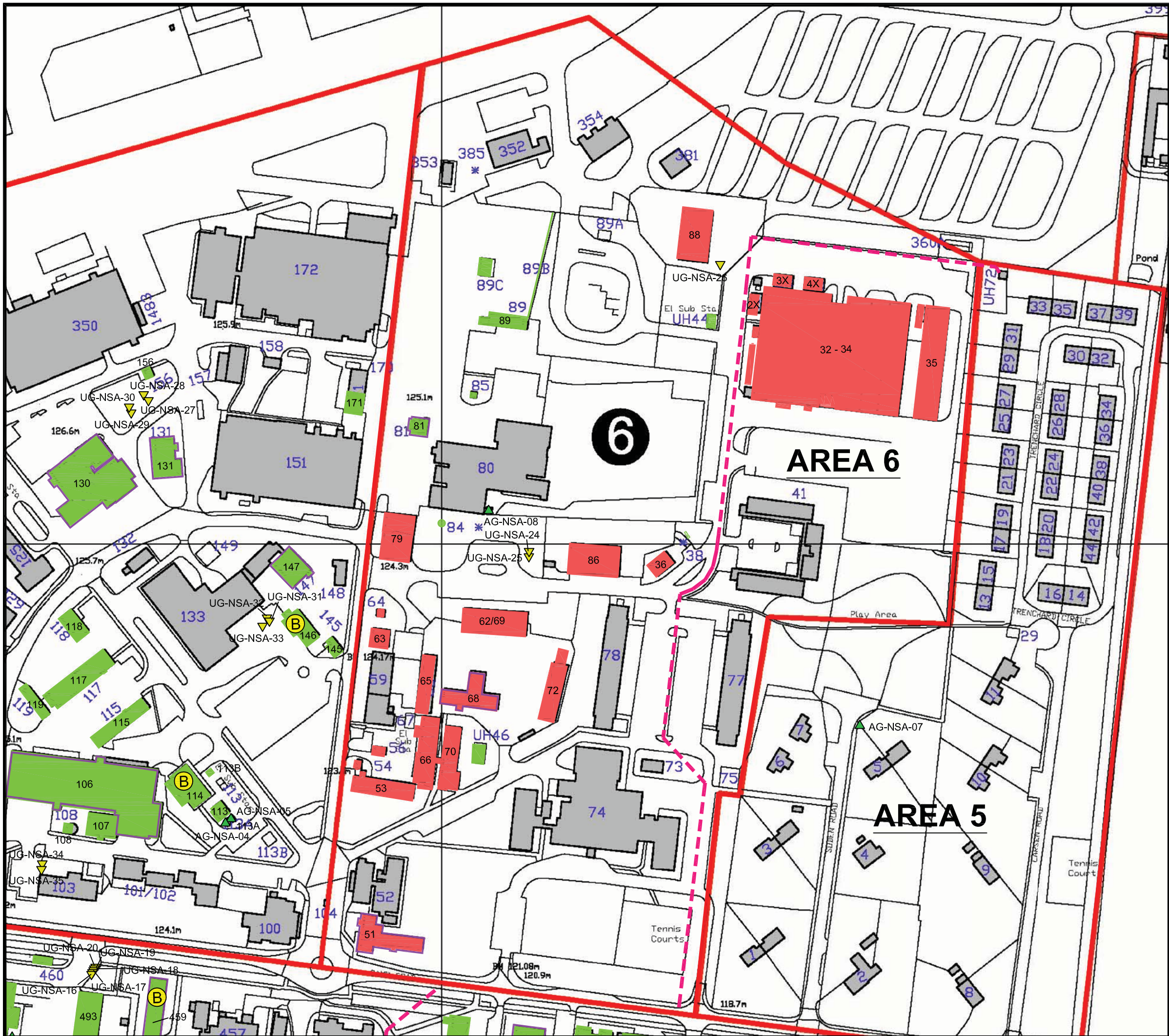
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Title: NSA Area 5

Client: Heyford Park Settlements LP

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Dwg: D3035_12_5	Contract: 3035	Scale: 1:2000



- Legend**
- Area Boundary
  - Buildings To Be Demolished:**
  - Phase-1
  - Phase-2
  - Proposed Foul Drain Run
  - WT Water Tower
  - B Bats Present
  - Licenced Asbestos Present

Ref: Waterman drawing: April 24th SI Features and res\_com boundaries.pdf & Jomas Upper Heyford Tank Data

- ▲ Above Ground Tank (AST)  
AG-NSA-01 to 03
- ▼ Underground Tank (UST)  
UG-NSA-01 to 20

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Title: NSA Area 6

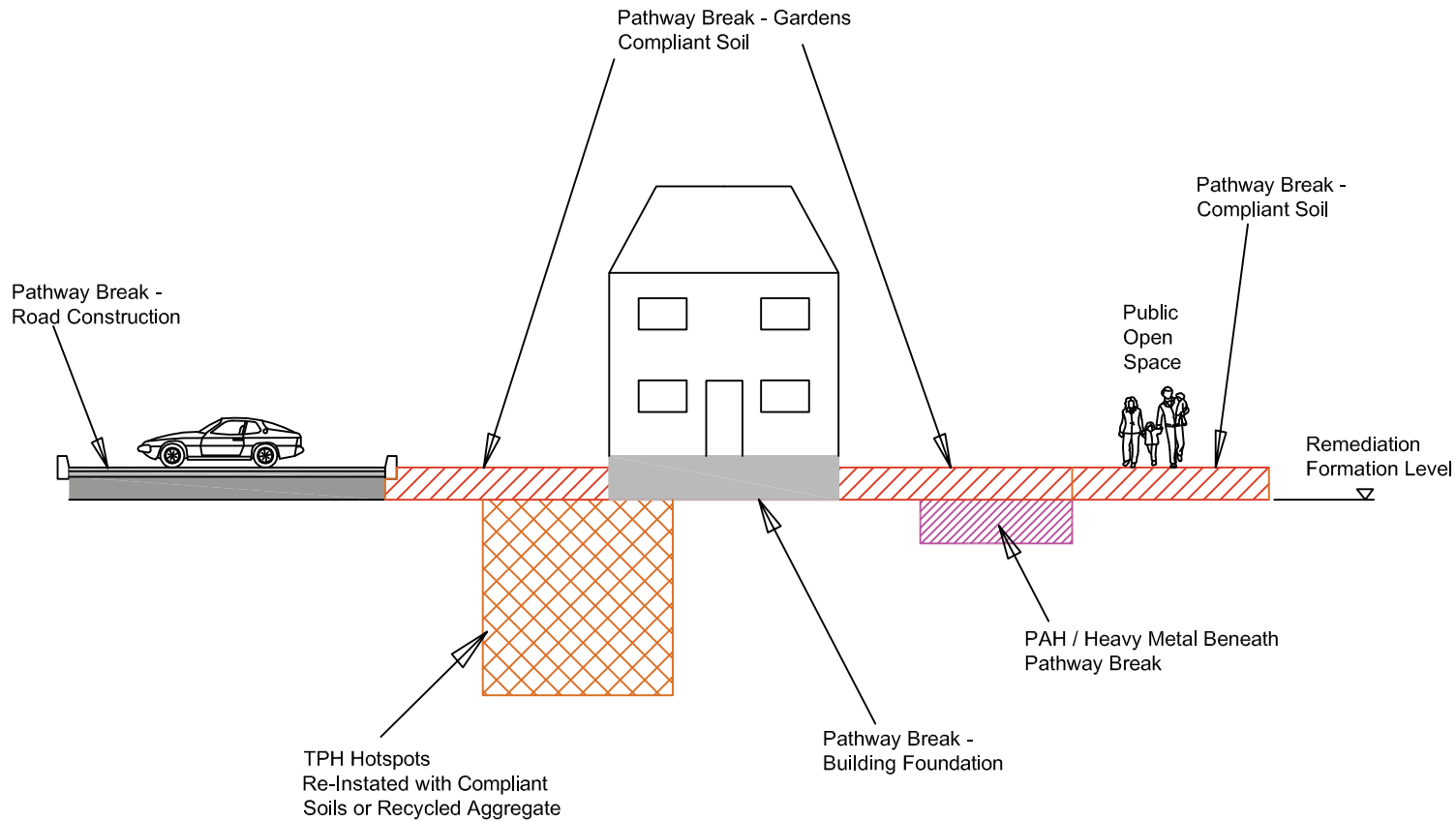
Client: Heyford Park Settlements LP

Drawn: MRG	Checked: TT	Approved: ML
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## Post Remediation Conceptual Model



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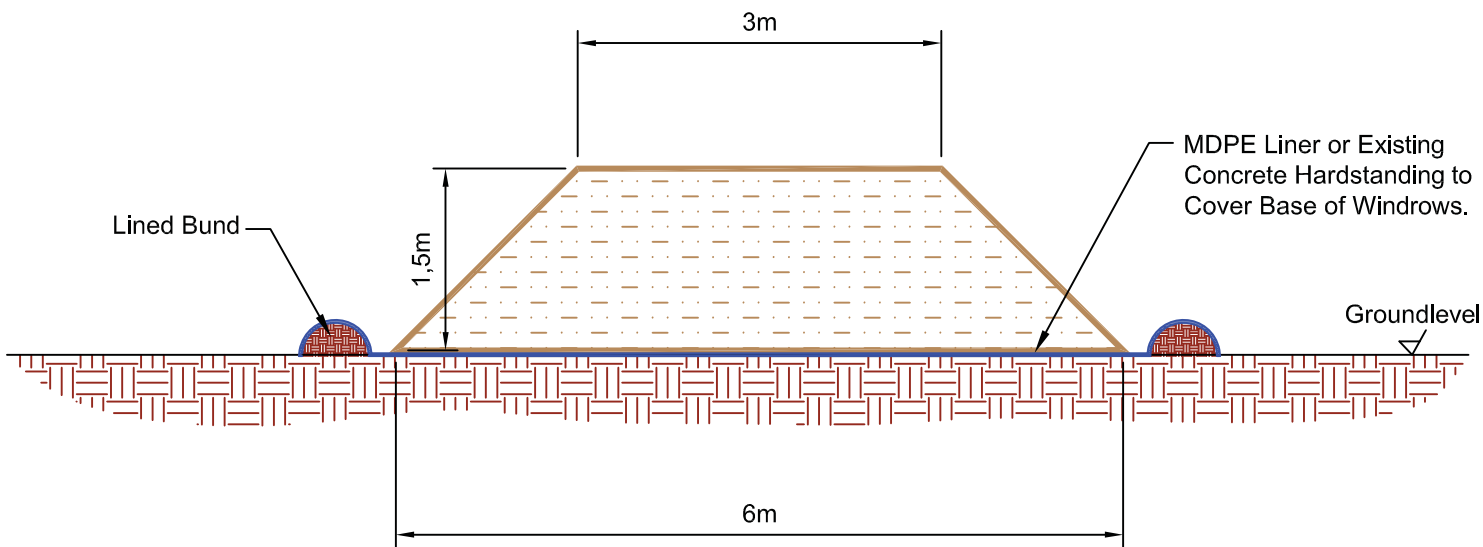
Site Address:	Rev:
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Title: Post Remediation Conceptual Model

Client: Heyford Park Settlements LP

Drawn: MRG	Checked: ML	Approved: ML
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Dwg: D3035_14	Contract: 3035	Scale: NTS
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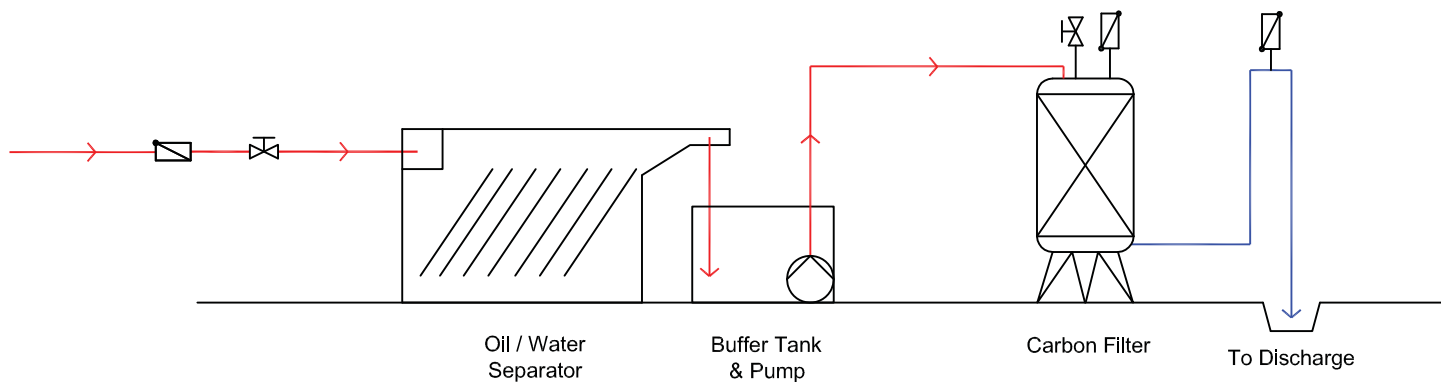
Site Address: Camp Road Upper Heyford Oxfordshire	Rev:
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Title: Cross-Section Typical Ex-Situ Windrow

Client: Heyford Park Settlement

Drawn: MRG	Checked: ML	Approved: ML
Dwg: D3035_15	Contract: 3035	Scale: NTS

### Indicative Water Treatment



Legend

- Contaminated Water
- Clean Water

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Title: Indicative Water Treatment Schematic


Client: Heyford Park Settlements LP

Drawn: MRG	Checked: ML	Approved: ML
Dwg: D3035_16	Contract: 3035	Scale: NTS

## **Appendix B**

### Permit to Proceed

INSERT PHOTOGRAPH	<u>BUILDING NUMBER</u>	<u>ASBESTOS REPORT NUMBER</u>	<u>Brief Description</u>		
<b>Authorisation to proceed to next hold point</b>					
	<b>Company</b>	<b>Position</b>	<b>Sign</b>	<b>Print</b>	<b>Date</b>
1	<b>Ecology</b>		All requirements have been discharged to permit demolition to		
1	<b>Party Wall Act</b>	YES - N/A	Confirm that no party wall issues exist to prevent work continuing		
	<b>Utilities Disconnectio</b>	<b>Present Y/N</b>	<b>Date Disconnecte</b>	<b>BY (Company Name)</b>	
2	HV Electric				
3	LV Electric				
4	Gas				
5	Water				
6	Telecom				
7	Other (State)				
	<b>Asbestos</b>	<b>Present (Y/N)</b>	<b>Date work completed</b>	<b>RE-OCCUPATION CERTIFICATE (DATE)</b>	
8	<b>Licenced</b>				
9	<b>Non Licenced</b>		REMOVAL COMPLETED		
10	Confirmation that the building is clear of all asbestos and certificate of reocupation issued for demolition to proceed				
11	<b>If demolition work concurrent with Licenced asbestos removal describe restricted areas not to be demolished until asbestos work completed and 8 signed off</b>				

		<b>BUILDING NUMBER</b>  <h1 style="text-align: center;">300</h1>		<b>ASBESTOS REPORT NUMBER</b>  <h2 style="text-align: center;">CWE0306-130</h2>		<b>Brief Description</b>  Red, brindled brick with red coloured mortar, concrete floors and timber, pitched, tiled roof. Large overhang to roof covering external concrete & steel access balconies to dormitory rooms. Metal windows with timber sub-frame.				
		<b>Authorisation to proceed to next hold point</b>								
		<b>Company</b>		<b>Position</b>		<b>Sign</b>		<b>Print</b>		<b>Date</b>
1 Ecology		BATS	All requirements have been discharged to permit demolition to			Waterman	project manager		paul manager	23.9.12
1 Party Wall Act		YES - N/A	Confirm that no party wall issues exist to prevent work continuing			Waterman	project manager		paul manager	23.9.12
		<b>Utilities Disconnectio</b>	<b>Present Y/N</b>	<b>Date Disconnecte</b>	<b>BY (Company Name)</b>					
2 HV Electric		Yes	30.9.12	Central Network	VertaseFLI	Site Manager		A. OLSEN	23.9.12	
3 LV Electric		Yes	1.10.12	Central Network	VertaseFLI	Site Manager		A. OLSEN	24.9.12	
4 Gas		Yes	2.10.12	Central Network	VertaseFLI	Site Manager		A. OLSEN	25.9.12	
5 Water		Yes	3.10.12	Central Network	VertaseFLI	Site Manager		A. OLSEN	26.9.12	
6 Telecom		Yes	4.10.12	Central Network	VertaseFLI	Site Manager		A. OLSEN	27.9.12	
7 Other (State)		Yes	5.10.12	Central Network	VertaseFLI	Site Manager		A. OLSEN	28.9.12	
		<b>Asbestos</b>	<b>Present (Y/N)</b>	<b>Date work completed</b>	<b>RE-OCCUPATION CERTIFICATE (DATE)</b>					
8 Licenced		Yes	4.10.12	ABCD-1234-2100 / 21-SE	Asbestos Contractor	SUPERVISOR		A.S.Bestos	26.9.12	
9 Non Licenced		Yes	5.10.12	REMOVAL COMPLETED	DEMO CONTRACTOR	SUPERVISOR		A.Forshaw	27.9.12	
10 Confirmation that the building is clear of all asbestos and certificate of reoccupation issued for demolition to proceed					DEMO CONTRACTOR	SUPERVISOR		A.Forshaw	28.9.12	
11		<b>If demolition work concurrent with Licenced asbestos removal describe restricted areas not to be demolished until asbestos work completed and 8 signed off</b>  Small area of AIB in NE Corner of 1st floor near Fire Exit - Independent access and enclosure. Can demolish down to bay 3								