GRS Stone Supplies Limited

Lower Hare Farm Inert Landfill

Operational Plan

Document Ref: 213189/OP

April 2022

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Contents

1.0 INTRODUCTION

Overview

1.1 This Operational Plan describes how the operation of the site will occur in accordance with Environment Agency standards and outlines how the activities will meet with risk assessment guidance from the Environment Agency website[1] and relevant sector guidance. The Operator is GRS Stone Supplies Limited. The waste operation is an inert landfill operation with associated recovery activities of engineering liner and restoration soils. The throughput is up to 100,000 tonnes per annum. The site location plan is presented in drawing 213189/D/001. The sensitive site receptors are presented in drawing 213189/D/002.

1.2 This Operational Plan outlines the waste activities/processes and the necessary controls required. This plan should be read in conjunction with the Environmental Site Setting and Design with appended H1 Environmental Risk Assessment (213189/ESSD), and Importation Protocol (213189/IP).

Working Hours

1.3 The site will operate in standard operating hours as presented in Table 1.

Table 1. Operating Hours

Days	Hours
Monday to Friday	0730-1800
Saturday (maintenance and emergency works only)	0800-1300
Sunday and Public Holidays	No vehicle movements or operation

2.0 MANAGEMENT

Management

2.1 The site will be operated in accordance with the Operator's site-specific Environmental Management System (EMS).

2.2 The site will have specific management plans including, but not limited to, the following:

- Operational Plan (this document);
- Accident Management Plan;
- Importation Protocol;
- Dust Management Plan;
- Drainage Strategy (within Operational Plan);
- Site and Equipment Maintenance Plan; and
- Complaints procedure.

2.3 These plans and other site procedures set out the following:

- Control of operations on the environment;
- Register of Environmental Effects;
- Monitoring of emissions;
- Management of Staff Competence & Training (Roles and Responsibilities);
- Training of all staff on EMP
- Record Keeping;

1 Environment Agency website, *Control and monitor emissions for your environmental permit* page, (accessed August 2021): https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

- Inspections (Daily Record and includes TCP presence);
- Policies;
- Review process of the EMS; and
- Site Closure arrangements.

Staffing

2.4 All staff and operatives have clearly defined roles and responsibilities with specified skills for each post required.

2.5 At all times there will be sufficient staff to manage and operate activities on the site without causing a risk to the environment. Staff employed at the site on a typical shift may include:

- Materials Engineer and Technically Competent Person (TCP) or delegate;
- Plant operative; and
- Site Manager.

2.6 In accordance with Environment Agency guidance[2] the site will be supervised by the TCP, in addition to at least one member of staff who is fully conversant with the requirements of the Permit and Operational Plan regarding, in particular, the following:

- Waste acceptance and control procedures;
- Operational controls and environmental monitoring;
- Maintenance;
- Record-keeping;
- Accident/incident action plans; and
- Notifications to the Environment Agency.

2.7 The TCP will be on site for at least 20 % of the operational hours at the facility.

2.8 Technical staff will demonstrate continuing competence by passing periodic assessment. Personal training records will be kept, to provide evidence.

2.9 All contractors will be trained about the relevant working controls and legal responsibilities relating to their areas of works.

2.10 The Site Manager will only authorise for works to be undertaken once relevant legal requirements and a site-specific risk assessment has been completed.

[2] Environment Agency website, Environmental permit competence requirements: changes to technically competent manager attendance, accessed August 2021 https://www.gov.uk/government/consultations/environmental-permit-competence-requirements-changes-to-technically-competent-manager-attendance

3.0 WASTE MANAGMENT OPERATIONS

Overview

3.1 This section of the Operational Plan outlines the waste management processes for the waste acceptance, storage and works at Lower Hare Farm. Schedule 1 details the processes operating at the site. Schedule 2.1 presents the permitted waste types for the infilling at Lower Hare Farm. The operations and the maximum and annual quantities of waste to be imported to the site are described in Table 2 below.

Table 2 Maximum and Annual Quantities of Waste and Non-Waste

Activity	Quantity
Inert Landfill: infilling of void using inert wastes (D1)	100,000 tonnes of waste per annum
Deposit for recovery: restoration including temporary storage and placement of GSL engineering fill and restoration soils including topsoil (R3, R5, R10 and R13)	700,000 tonnes of waste in total.

3.2 Only waste from pre-selected contracts are permitted at the site. There are no-adhoc acceptance of material at the gate. No hazardous waste is to be accepted. The permitted waste operations and permitted waste types are detailed in Schedules 1 and 2.

Waste acceptance, storage and quarantine

3.3 The Importation Protocol (213189/IP) is implemented at the site to ensure that all material conforms to the required standard. The Importation Protocol contains the performance specification, testing and inspection requirements.

3.4 Prior to permitting the delivery of the waste, the waste producer is required to provide the operator with sufficient information for a basic characterisation of the waste. All wastes transported to the site are weighed by estimated density to its container size or by weighbridge. Only permitted waste that conforms to the type and description in the documentation supplied by the producer and/or holder will be accepted. The waste must conform to the pre-importation data on the WAF sheet.

3.5 The site operates a quarantine area. The quarantine area will be situated in the site office / car park area shown on drawing 213189/D/004. The quarantine area is flexible in size. It can accommodate small isolated non-compliant waste in sealed, lockable containers; or larger stockpiles of material underlain and covered by HDPE geomembrane plastic sheeting to prevent pathways to local receptors.

3.6 When plastic sheeting is to be used, the basal sheeting rolls be overlapped to ensure sufficient seal between rolls. Once the cover plastic has been placed, the quarantined material will be left until final classification has been determined. The area will not be disturbed and will be appropriately sign posted to ensure no risk of disturbance or damage to the plastic liner.

3.7 If material is deemed potentially unsuitable the producer will be notified and no further import of the suspect material will be permitted until the matter is fully resolved.

Inert Landfilling & Restoration Activities

3.8 Operations involve the storage and placement of imported suitable mineral-based wastes using a bulldozer. HGV's will be the method of delivery. The wastes comply with the Importation Protocol (if inert wastes), the CQA Strategy Plan (if geological separation layer engineering fill) or the Restoration Plan (if restoration soils).

4.0 ENVIRONMENTAL OPERATING CONTROL

Drainage and pollution control

4.1 During the operations, surface water is managed in accordance with the Detailed Drainage Design (shown in Appendix A)

4.2 The Hydrogeological Risk Assessment (HRA) has provided importation criteria which are implemented for the protection of groundwater, and therefore the percolation into the ground or redirection to nearby ditches should not result in pollution of the ground or surface waters.

4.3 Fuel is stored in a mobile self-bunded fuel bowser conforming to the Control of Pollution (Oil Storage) (England) Regulations 2001. All maintenance of plant on-site will be undertaken on hardstanding near the site compound.

4.4 The site supervisor ensures that only authorised and trained staff carry out activities involving the refuelling of plant or associated maintenance.

4.5 Other oils and lubricants are stored within the sealed container, stored within lockable units of the welfare cabin. All plant and materials when not in operation are stored in the main compound area. The operation of machinery can generate a risk of spillages from hydraulic hose burst. A site spillage plan is within the EMS at the site. The spillage plan outlines how oils and hydrocarbons will be contained and cleaned up.

4.6 The materials accepted on site comply to the thresholds set out in the Importation Protocol for the protection of both Human Health and Controlled Waters and will be monitored via the waste acceptance criteria set out in the Importation Protocol. Inspection and validation testing requirements are in accordance parameters set out in the Importation Protocol.

4.7 Surface water and groundwater monitoring will be undertaken on a quarterly basis and detailed in the Hydrogeological Risk Assessment. The monitoring locations are shown on drawings 213189/D/008.

Procedures for control and remediation of leaks and spillages

4.8 Leaks and spillages from operational equipment and plant on site are controlled by the application of good housekeeping techniques and regular documented maintenance of all plant and equipment. Spill kits and absorbent granules/pads are maintained at the site offices.

4.9 All site staff are trained to deal with leaks and spillages according to the spillage management procedure. The site supervisor and TCP ensure that any required remedial actions are completed to an appropriate standard. In the unlikely event of a significant spillage that could not be controlled on site, the EA is notified as soon as possible. All significant spillages and leaks are recorded in the Site Diary.

Noise

4.10 The noise levels generated by the site operations will not result in nuisance due to the nature of surrounding land and its uses, the hours of the operations and the distance of the site from nearby residential properties. The majority of the site is set within a natural depression which provides natural attenuation throughout the infilling.

Air emissions

4.11 There will be no point source emissions of air pollutants. Any release will be fugitive. Operations at the site will be undertaken in accordance with the Dust Management Plan (213036/DEMP).

Litter

4.12 The waste types received at the site will have no litter. The site will be inspected daily and any litter identified will be bagged and removed from the site.

Mud

4.13 The following controls are in place to ensure that mud is controlled from leaving the site and impacting on surrounding local roads. The site is accessed via an internal access route from Lower Hare Farm to the public highway to the south of the site. The internal haul route is surfaced with impermeable surfacing either tarmac and/or concrete. There is also a wheel wash at the site egress.

4.14 All vehicles will be inspected to ensure they were clean to avoid mud being carried onto the internal road. All vehicles will be briefed on using the wheel wash before leaving site. In the event that wheels and under carriage are muddy they will hand washed.

4.15 In the event that excessive mud or dust is deposited onto the public highway, sweeping of the impacted area will be organise immediately. Any routine inspections and subsequent actions will be recorded in the Site Diary.

Odour

4.16 The permitted material for filling have a low odour potential. This will be managed through the Importation Protocol. Accordingly, the risk of imported materials being malodorous is considered to be very low.

4.17 Any complaints will be recorded in the site diary and the malodorous waste source investigated.

Fire

4.18 No fires or burning of waste is permitted at the site. The risk associated with the occurrence of fire on the site is anticipated to be low. Any occurrence of fire at the site will be regarded as an emergency and acted upon immediately upon discovery. Daily inspections will include visual observations of plant and vehicles to identify any potential evidence of smouldering. No 'hot loads' will be brought to/accepted at site.

4.19 The site has security arrangements during normal working hours. The site is fully fenced and locked at night. Access to the site is controlled through one entrance. These measures will prevent unauthorised access and the potential for vandalism and the risk of arson.

4.20 The operations are a low burning potential. The following actions in the event of fire will be undertaken:

- Notify the Fire Brigade immediately and the EA as soon as is practicable;
- Isolate the burning area and attempt to extinguish the fire, if this can be undertaken without placing any member of staff or the public at risk; and
- Evacuate the site if the fire is not containable in line with Health & Safety Plan.

4.21 All instances of fires (or suspected fires resulting from arson or vandalism) will be recorded in the Site Diary.

4.22 The permitted wastes have a low combustion potential and no fire or burning of material will occur on site. The site will be secured when not in operation and any fuel sources securely stored and locked.

Pests

4.23 The waste recovery activity is considered to have a low risk of attracting pests. The site inspection regime will identify the presence of any pest and implement necessary controls to remove pests from the site.

5. WASTE

5.1 The operation is designed to import inert material and use engineering fill and restoration soils to restore Lower Hare Farm to improve drainage for use as agricultural land. In the very unlikely event that there are any non-compliant materials, they are segregated and sent for onward use or recovery by suitably licenced facilities.

5.2 Recovery and disposal routes appropriate to the nature of the residual waste generated by the recovery will be managed in line with the waste hierarchy, to ensure materials are reused and recovered where practicable.

5.3 The Operator adheres to Section 34 of the Environmental Protection Act 1990 'Waste Management: The Duty of Care – A Code of Practice'. Residual wastes are stored in appropriate covered bays and/or containers, which are correctly labelled. Waste streams, in particular those designated to be disposed of, are constantly assessed by the management team to ensure the efficiency of the recovery operations is maintained. Quarterly waste returns are completed and submitted to the EA in accordance with the Permit requirements.

5.4 All materials transferred from the site are supported by Waste Transfer Notes and suitable Duty of Care paperwork.

6. INFORMATION MANAGEMENT

Records

6.1 All records required by the Permit are held by the Operator. The Operator keeps all records relating to the site in the main office.

6.2 The Site Diary is maintained by the site management. All records relating to the site are kept for a minimum for 2 years. The following significant events is recorded in the Site Diary:

- Maintenance of plant in accordance with manufacturer's recommendations;
- Breakdowns;
- Emergencies;
- Problems with material stockpile quality and action taken;
- Site inspections and consequent actions carried out by the operator. These include those undertaken by specialists;
- Technically competent management attendance at site;
- Any Monitoring undertaken;
- Importation volumes and Duty of Care paperwork;
- Severe weather conditions which adversely affected site activities;
- Complaints about site operations and actions taken; and
- Environmental problems and remedial actions (including spills and leaks).

6.3 All records are held electronically and be available to the relevant authorities on site.

Reporting

6.4 Within one month of the end of each quarter, the Operator submits to the Environment Agency the tonnages of the waste received and recovered, as well as any waste to disposal as necessary.

6.5 Any other requirements of the permit are reported accordingly. This includes:

- Notification when plant has broken down resulting in a potential to pollute;
- When a condition of the permit has been breached; and
- When a limit in the permit has been breached and there is considered significant adverse impact

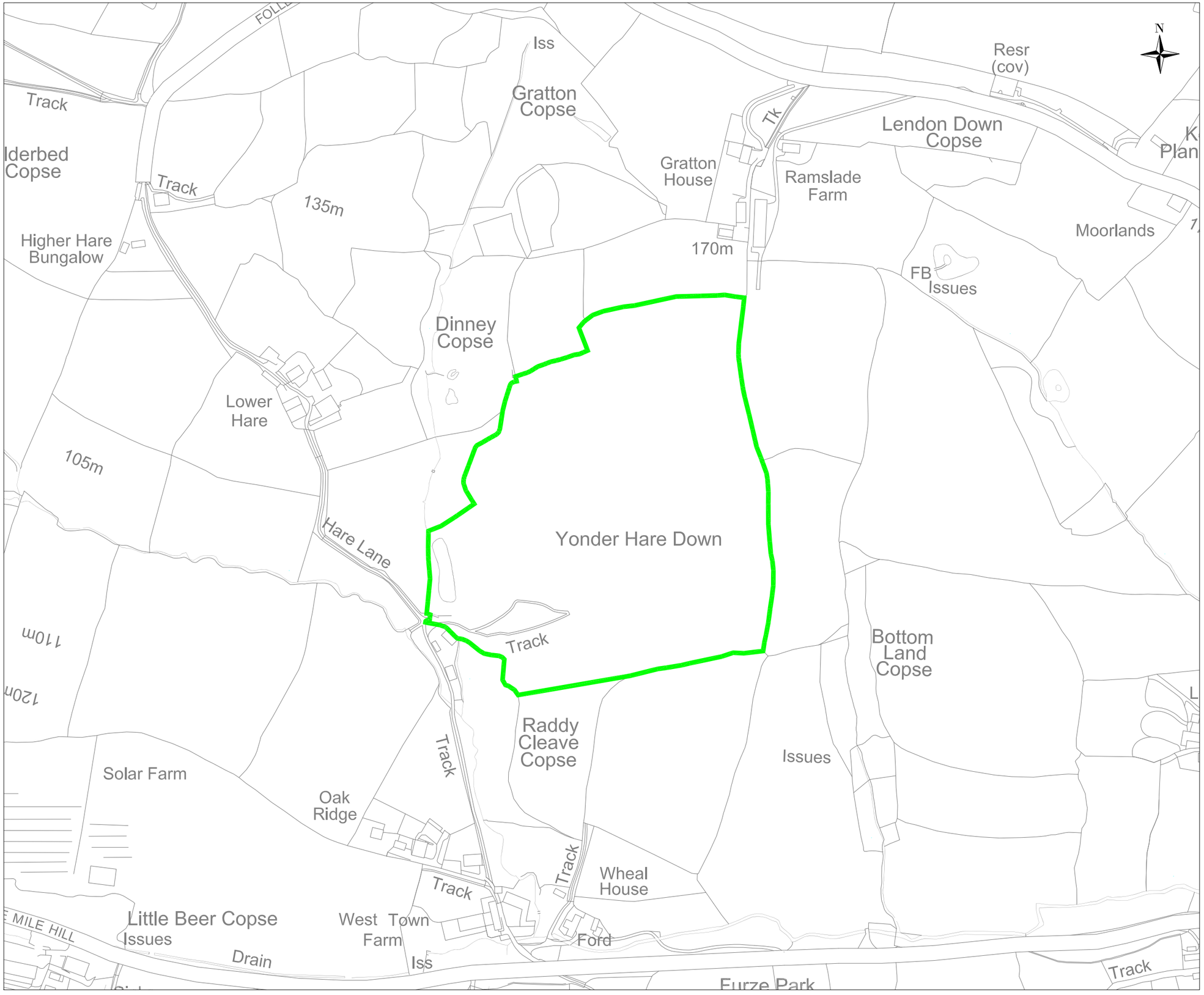
Duty of Care

6.6 In accordance with Duty of Care requirements, the Operator maintains a schedule of all waste transfers from the site. The schedule and Duty of Care paperwork is made available for inspection, as required. Records are maintained at the Operator's main office.

Availability of Permit and Management Plan

6.7 A copy of the Permit, all management plans and the supporting documents, is kept available on site for reference when required by all site staff carrying out work under the requirements of the Permit.

DRAWINGS



Key:

Permit Site Boundary

Rev.	Details	Drawn / Chkd.	Date

Project

213189
Lower Hare Farm

Title

Permit Boundary Plan

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Scale	Date	Drawn	Chkd.	Drg. No.	Rev.
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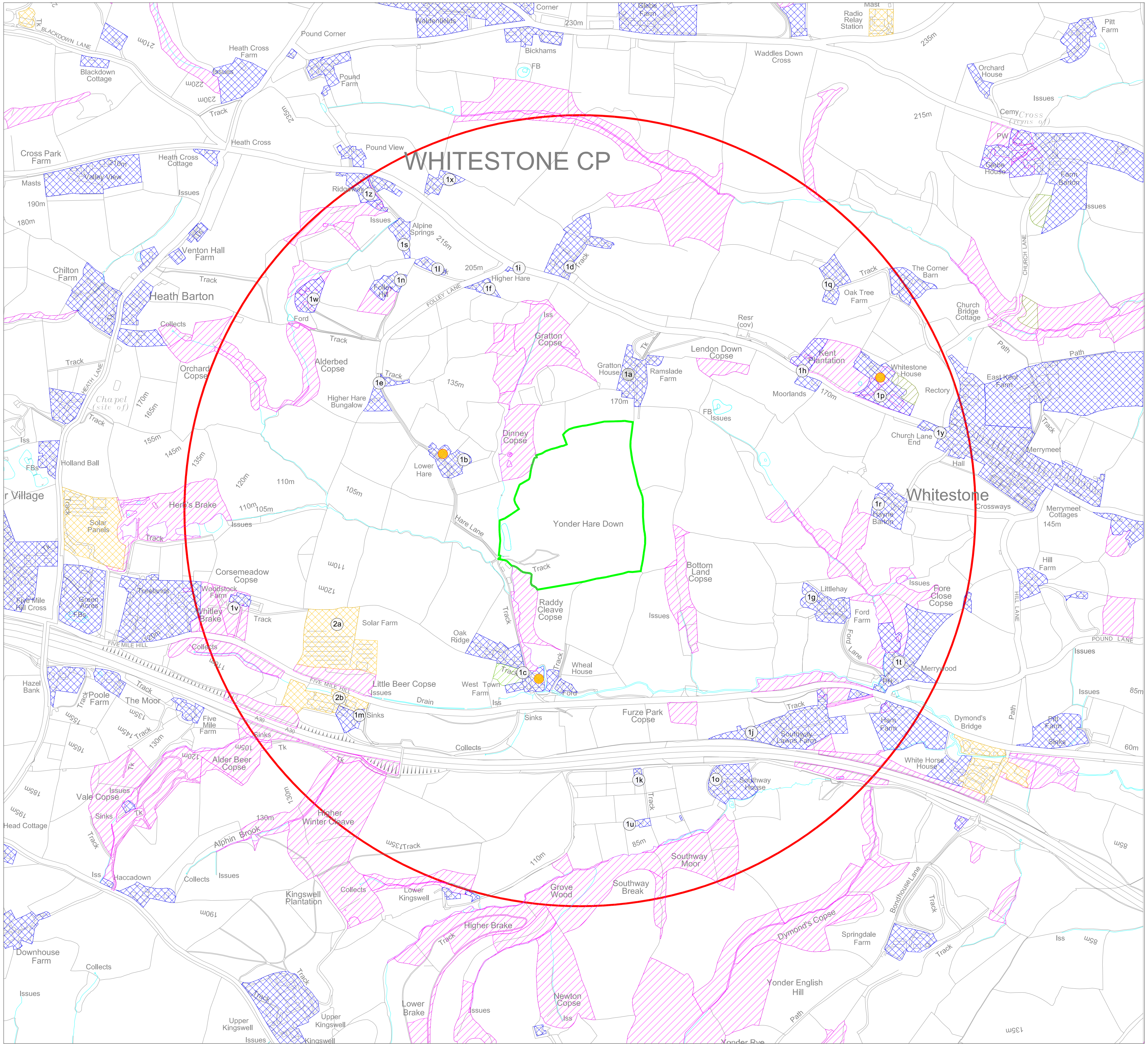
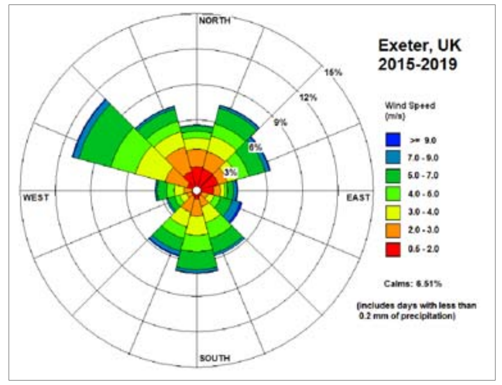


Key:

- Permit Site Boundary
- 1km Radius
- Listed Buildings
- Commercial/Industrial Receptors
- Residential Receptors
- Priority Habitat - Deciduous Woodland
- Priority Habitat - Traditional Orchard
- Surface Water Course Receptors



Rev.	Details	Drawn / Chkd.	Date

Project
213189
Lower Hare Farm

Title
Site Receptor Plan

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Scale	Date Nov'21	Drg. No.	Rev.
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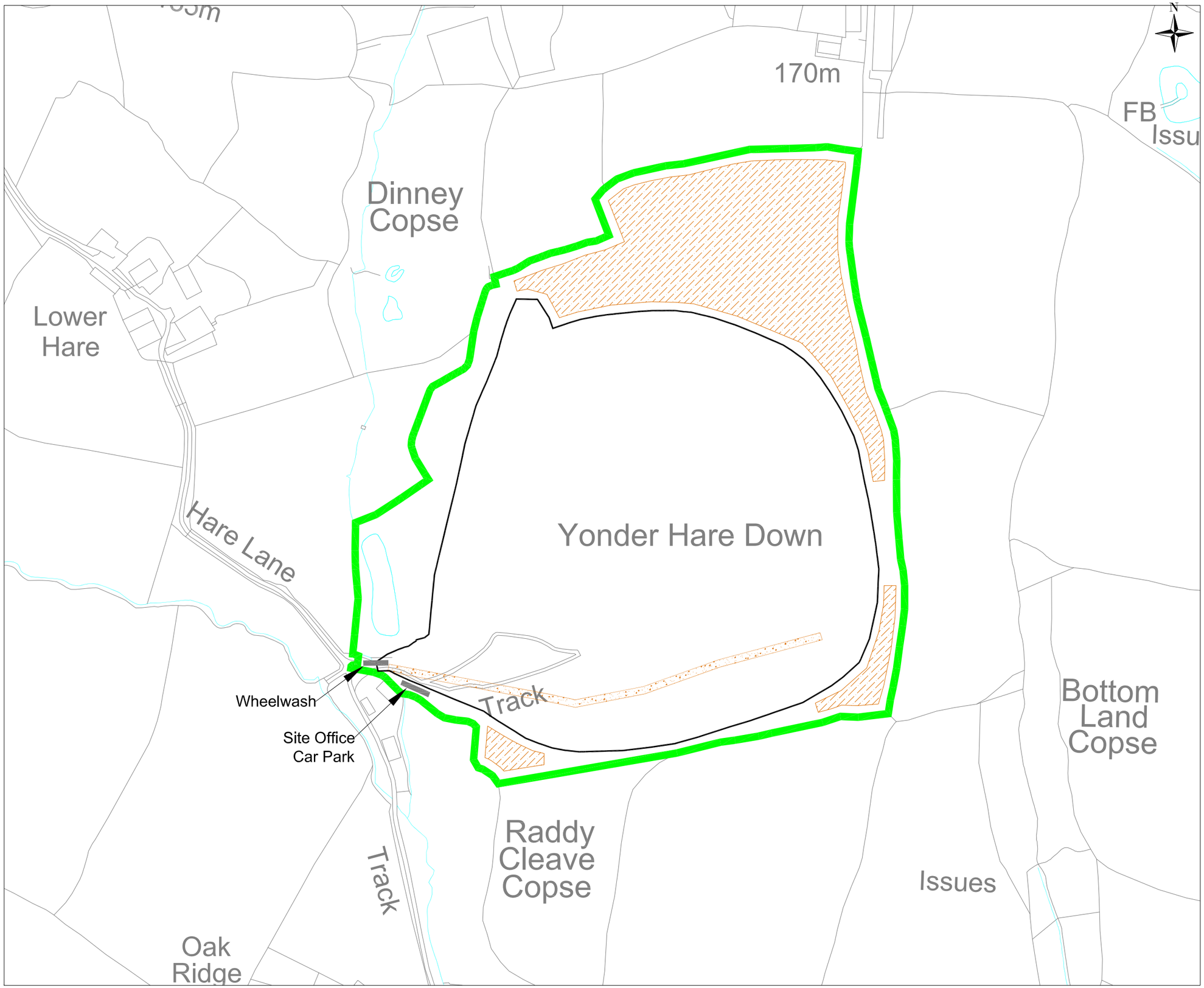

Key:

- Permit Site Boundary
- Extent of Earthworks
- Haul Route
- Indicative Topsoil Storage

Notes:

1. The Topsoil storage location will be in accordance with the Ecological Mitigation Plan and/or the Planning Permission.
2. Haul route location will change dependent on the phase of work.
3. There is no crushing or screening on site.

Rev.	Details	Drawn / Chkd.	Date

Project

213189
Lower Hare Farm

Title

Site Layout Plan

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Scale	Date	Drawn	Chkd.	Drg. No.	Rev.
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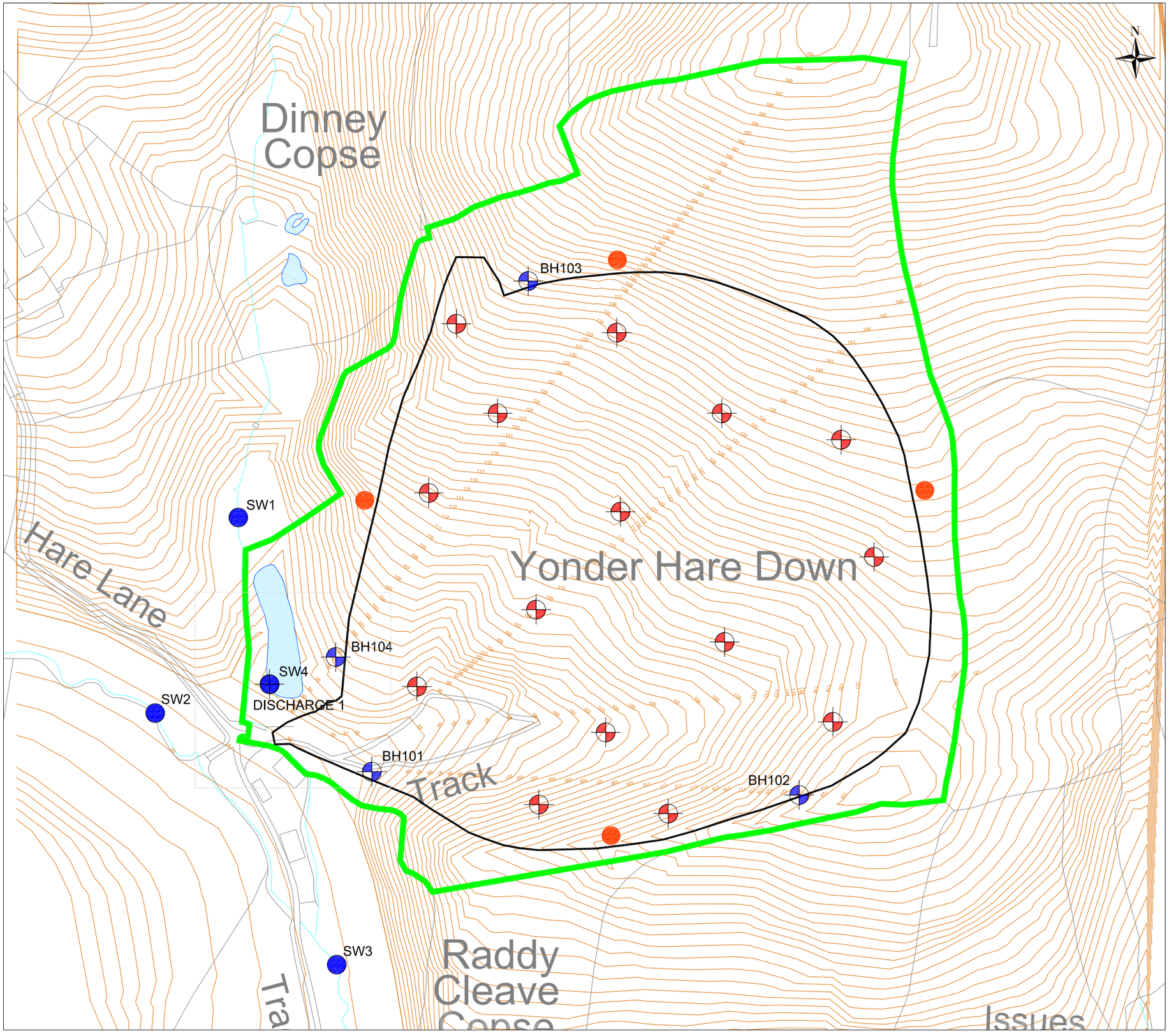

Key:

- Permit Site Boundary
- Existing Ground Level (m AOD)
- Extent of Earthworks
- Groundwater Monitoring Boreholes
- Surface Water Monitoring Location
- Visual Dust Monitoring Location
- Surface Water Pond
- Surface Water Course
- Post in-waste gas monitoring locations

Surface Water Monitoring Point Coordinates		
ID	X	Y
SW1	285558	93422
SW2	285516	93313
SW3	285609	93184
SW4 (Discharge Point)	285574	93328

Rev.	Details	Drawn / Chkd.	Date

Project
213189
Lower Hare Farm

Title
Monitoring Plan

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Scale	Date	Drg. No.	Rev.
1:2,000@A3	May'22	213189/D/008	
	Drawn: KE / Chkd.: EB		

Schedules

Schedule 1.1 Activities Description of activities for waste operations	Limits of activities
D1: Deposit to inert landfill	Bulk fill of the landform infilled with inert wastes listed in table S2.1.
R13: Storage of wastes pending any of the operations numbered R3 and R5 R3: Recycling/reclamation of organic substances which are not used as solvents R5: Recycling or reclamation of other inorganic wastes R10: restoration to agricultural land.	Secure storage and use of wastes listed in table S2.2 and S2.3 for the purpose of construction engineering and restoration purposes as detailed in the approved Restoration Plan. The geological separation layer (GSL) will be in accordance with the CQA Strategy Plan. Materials in Table S2.4 will be for temporary haul roads and lay down areas only. Temporary haul roads will be removed once non-operational.

Schedule 2.1 Permitted Wastes for the inert landfill	
Waste code	**Description**
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	Soil and stones other than those mentioned in 17 05 03
20	**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**
20 02	**Garden and park wastes (including cemetery waste)**
20 02 02	Soil and stones

Schedule 2.2 Permitted Wastes for the GSL engineering construction	
Waste code	**Description**
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	Soil and stones other than those mentioned in 17 05 03
20	**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**
20 02	**Garden and park wastes (including cemetery waste)**
20 02 02	Soil and stones

Schedule 2.3 Permitted Wastes for the restoration soils	
Waste code	**Description**
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	Soil and stones other than those mentioned in 17 05 03
20	**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**
20 02	**Garden and park wastes (including cemetery waste)**
20 02 02	Soil and stones

Schedule 2.4 Permitted Wastes for the temporary haul roads and lay down areas	
Waste code	**Description**
17	**Construction and demolition wastes (including excavated soil from contaminated sites)**
17 01	**Concrete, bricks, tiles and ceramics**
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	Soil and stones other than those mentioned in 17 05 03
20	**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**
20 02	**Garden and park wastes (including cemetery waste)**
20 02 02	Soil and stones

APPENDIX A

LOWER HARE FARM
INERT LANDFILL

DETAILED DRAINAGE DESIGN

April 2022

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Report ref 213189/DC/001

1. SCOPE

This report details the drainage design to regulate run off from the restored site and the temporarily installed drainage during the landfilling regime.

The topography of the site is complex, with the land falling predominantly north to south. A small section of the site in the south drains northerly.

The surface water runoff is primarily collected in a valley (in the south of the site) which discharges south westerly to the local river network. There is no attenuation. The runoff from the agricultural land on the west of the site is partially collected in a pond which similarly discharges to the west into the river network.

The land in the east of the site predominantly flows to the valley however a small area can collect and pools in the southeast corner. The existing topography indicates that this area of land could drain south easterly onto adjacent fields, however site inspections have determined that the land around the hedge line is slightly raised and subsequently run off simply collects and pools.

The surface water drainage proposals, both temporary and permanent, submitted at planning intercepted run off directing it into the pond in the west of the site where it would be attenuated. The drainage would be attenuated to greenfield run off rates. Due to restricted topographical data, no detailed design had been completed.

This report provides the topographical details of the existing pond and details the permanent and temporary drainage proposals.

The design has been undertaken to deliver the run-off rates set out in the approved Level 2 Flood Risk Assessment and Surface Water Drainage proposals. This design has been submitted to discharge parts a to f of condition 8 of planning application 19/00207/DCC.

2. EXISTING WESTERN POND

The existing pond was surveyed by Alan Wade Site Engineering Limited in early December 2021. The topographical data is presented in Drawing 213189/PL/D/008 along with the wider contours in the southeast of the site. The pond characteristics are set out in Table 2.1.

Table 2.1 Existing Pond Details	
Outlet Invert	90.66 m AOD
Inlet invert	91.99 m AOD
Maximum water level	Assumed to be invert level
Top of bank (lowest level)	92.20 m AOD
Pond basal level	90.18
Pond liner	None
Pond plant	Very limited vegetation. Dead reed in centre. Evidence of 2021 maintenance and desilting.

3. PROPOSED PERMANENT POND AND SURFACE WATER DRAINAGE DESIGN

3.1 Overview

The permanent drainage proposal follows the principles set out at planning. The restored site is split into 3 fields, Field 1 and 2 cover 40% of the site located in the north. Field 3 covers circa 60% of the site and covers the southern section. Fields 1 and 2 are separated from Field 3 by a Devon Hedgebank and runoff will be conveyed to the pond in the southwest by a swale constructed on the upstream side of the hedgebank.

Restored Field 3 runoff drains both easterly and westerly due to a ridge that runs north to south through the site. Drainage to the east is intercepted by a swale and conveyed via an ecological pond to the main attenuation pond in the southwest of the site. Drainage from the rest of the Field 3 flows directly to the attenuation pond or is collected by the swale running along the southern boundary and conveyed to the pond.

The drainage design and directions of flow are presented in Drawing 213189/PL/D/010

The permanent attenuation pond has been designed to regulate the flow controlling the discharge to the greenfield run off rate (as agreed at the planning stage). The ultimate flow rate is higher than that assessed at planning because the pond is designed to attenuate the total area of the site (circa 11.5 hectares(ha)) and not solely the area of landfill works (circa 7.7 ha) which was assessed at the planning stage.

3.2 Attenuation Pond Design Detail

The attenuation pond in the southwest of the site has been designed and will be constructed to attenuate the runoff from the site to greenfield run off rates. This design process has significantly increased the size and storage capacity of the pond, through both deepening and widening. Following detailed review it was conceded that if the lagoon was to attain the required run off it could not accommodate ecological enhancement measures that were agreed. Subsequently a secondary pond is to be constructed for ecological purposes in the southeast of the site.

The proposed permanent pond and drainage is shown in Drawing 213189/PL/D/010 and the cross sectional detail shown in 213189/PL/D011.

The permanent drainage pond design details are set out in Table 3.1 and the supporting calculations are set out in Appendix A. The final regulation of the flow is achieved through two hydrobreaks and an orifice plate. The detail is set out in Table 3.1 and Table 3.2.

Table 3.1 Main Attenuation Pond Details	
Pond base	Pond Base - 87.50 m AOD
Pond top	Pond Top - 92.50 m AOD
Side Slopes	1:2 Gradient
Pond liner / infiltration allowance	None / No infiltration allowed for
Pond stream storage capacity and levels 1 year	 Run off rate: 24.9 l/s Top of water: level 88.87 m AOD Storage volume: 650 cu m
30 years	Run off rate: 60.8 l/s Top of water: level 90.05 m AOD Storage volume: 1623 cu m
100 years + 40 % Climate Change	Run off rate: 77.2 l/s Top of water: level 91.95 m AOD Storage volume: 4040 cu m

Table 3.2 Flow Controls	
Controls (complex) down stream of lagoon	Hydrobrake vortex 1 @ 87.500 m AOD – 24.9 l/s @ 1.5 m Head Hydrobrake vortex 2 @ 88.870 m AOD – 30.0 l/s @ 2.5 m Head Orifice Plate 3 @ 90.050 m AOD – 250mm DIA

3.3 Ecological Pond

The ecological pond is connected to the attenuation pond by a swale that extends across the southern section of the site, on the edge of the headland. The ecological pond has been designed to have soft shelving banks to permit boggy fringes to develop, marginal plants to establish a deeper water area. The pond is shown in Drawing 213189/PL/D/010 and cross sections shown in 213189/PL/D/011. The design detail is presented in Table 3.3.

Table 3.3 Ecological Pond Details	
Pond base	Pond Base – 121.00 m AOD
Pond top outlet	Pond Top – 122.0 m AOD
Side Slopes	1:2 Gradient
Pond liner / infiltration allowance	None / < 1 x 10^{-9} m/s

The pond ecological design is set out in the Landscape Ecological Management Plan (LEMP).

3.4 Swales

Water from the land and the ponds are collected by drainage swales and conveyed to the permanent pond. The northern swale is to be constructed during year 1, intercepting run off from 40% of the site area.

The southern swale provides an overflow from the ecological pond in the southeast of the site. The swale collects run off from the restored site. As the swale falls towards the attenuation pond the gradient steepens to greater than 1:3. To prevent significant erosion this section of drainage will be piped (450 mm diameter).

A smaller swale extends to the east from the ecological pond, to intercept any runoff draining from the north towards the site low spot, preventing the extant condition of standing water.

The northern and southern swales have both been designed to include stone-filled gabions (circa every 20 m) to dissipate the run-off energy as it flows down the steeper gradients. The indicative locations are shown on the Drawing 213189/PL/D/010.

3.5 Phasing of permanent drainage construction

The northern swale and the attenuation pond will be fully constructed in Year 1, Phase 1 of the landfill works, prior to the landfilling activities.

The southern swale will be constructed during Phase 3 of the restoration activities. It is anticipated that this will be completed in year 9 and 10 of the restoration works.

4. TEMPORARY DRAINAGE

The permanent pond will be constructed in Year 1 before the main landfilling activities occur at the site. In addition the swale conveying runoff from Field 1 and 2 will also be fully constructed and operational. This provides the permanent attenuation from the outset of landfilling activities and also reduces the volume of runoff.

The drainage strategy proposed at planning further assessed the potential impacts of landfilling activity compacting soils, introducing lower permeability fill and subsequently decreasing infiltration. This would act to increase run off rates at the site. BRE 365 tests completed at the site (see Appendix B) have identified that the shallow deposits provide negligible infiltration at the site and it is arguable that landfilling will not increase run off rates. That said, temporary drainage will be installed at the site to maximise attenuation during construction and reduce suspended solid loading.

Drawing 213189/PL/D/012 sets out the proposed addition of two temporary lagoons, managing the water from field 3 during landfilling activities. These two lagoons are in addition to the permanent attenuation pond located in the southwest of the site. These will be constructed in Year 1 of the development and have been designed to provide the same retention volumes as the 3 lagoons assessed in the concept scheme at the planning stage. The volume of water in each lagoon 2 and 3 is 1849 and 1486 cu m respectively, providing 3335 cu m of storage capacity to the 4040 cu m provided by the permanent lagoon (termed Lagoon 1). This exceeds the provision assessed as required at the planning stage. During construction, temporary drainage ditches will be constructed adjacent to the access tracks and across areas of infilling directing flow to the temporary lagoons.

Lagoons 2 and 3 will be retained until the final phase of landfilling. Each storage lagoon will be retained as long as possible in Phase 3. Lagoon 3 will be infilled first and as the engineering works progress westerly Lagoon 2 will be infilled. It is anticipated that the two lagoons will serve the site until at least year 7 of the development. Lagoon 2 is anticipated to be decommissioned and infilled in year 8.

5. MAINTENANCE

5.1 Overview

This Section sets out the principles for the long term management and maintenance of the surface water drainage system. The purpose is that the owner undertakes a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding. The activities listed in this document are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements, Specific maintenance needs of the SuDS elements should be monitored and maintenance schedules adjusted to suit requirements. The maintenance of the ecological pond is set out in the LEMP.

All those responsible for maintenance should follow relevant Health and Safety legislation (Health and Safety at Work Regulations, 1999) for all activities listed within this report including lone working, if relevant, and risk assessments should always be undertaken.

Any contractor employed by the landowner shall carry out periodic maintenance of all such SuDS in accordance with the schedules listed in this report. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.

The operations contained within this plan shall (where feasible) be in conjunction with routine grounds maintenance operations to the surrounding landscape.

5.2 Maintenance requirements

The operations contained within this section specific to the maintenance of landscaping, shall be read in conjunction with any development landscape maintenance plan(s).

The land drainage system including the attenuation basin, swales and associated inlet / outlet headwalls and pipework will be subject to a routine monitoring and maintenance schedule as part of the general site management.

This will be carried out at monthly intervals between 1 April and 31 October and once between 1 November and 31 March unless otherwise detailed.

A record of maintenance visits and remedial operations shall be maintained. The following guidelines are offered as an initial regime, but maybe either increased or decreased by the management company depending on the local environment and any external contributing factors.

The key maintenance requirement for the attenuation basin, swales and associated inlet / outlet headwalls and pipework will be the maintenance of vegetation and mowing of grass within and on the banks/verges and the removal of accumulated sediments and collection of litter and debris. During the inspections the general operation, and structural condition of the inlet / outlet headwalls and any erosion of banks or scour control features should be identified and rehabilitated as required.

Vegetation within and on the banks of the pond should be trimmed twice a year, preferably in April and October to a height of 100 mm to establish a dense sward and provide long grass margins which will discourage public access down to the water's edge.

Vegetation in and on the banks of the swale should be trimmed at least twice a year or as required to maintain a height of 75–150 mm.

Cuttings from any clearance work should be removed from the pond and swale to avoid it causing blockages downstream.

Accumulated sediments should be removed from the bed of the swale as required (once deposits exceed 25 mm in depth). The frequency of this operation can vary depending on local conditions, however it is recommended that the level of silts should be monitored at least once a year and a maintenance regime implemented to suit.

De-silting of the attenuation ponds will usually be on a 10-15 year cycle depending on the on-going silt level checking. The desilting work will be carried out under the supervision of consulting engineers and to a pre-agreed method statement. Such a method statement should be submitted in writing to the local authority and agreed in advance of the commencement of the works. Desilting of the temporary attenuation ponds will be undertaken at least annually, typically in the summer months.

Prior to desilting works commencing, a suitably qualified ecologist shall be appointed to undertake an assessment of the ecological interest within the pond and its margins. In the event that the attenuation ponds develop particular ecological interest, then careful consideration will be given to the timing of this operation.

Sediments excavated from the pond and swale that receive runoff from greenfield areas are not toxic or hazardous material and can be safely disposed of by land application subject to the correct waste regulatory regime.

Schedule 1. Maintenance schedule for attenuation pond

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Schedule 2. Maintenance schedule for conveyance swales and pipe

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Designer: Chris Pendle, MJA Consulting Limited

Author: Ed Brown BSc (Hons), MCIWM

Reviewer: Matthew Lawman MSc BSc (Hons)

Date: 21st April 2022

Report produced by:
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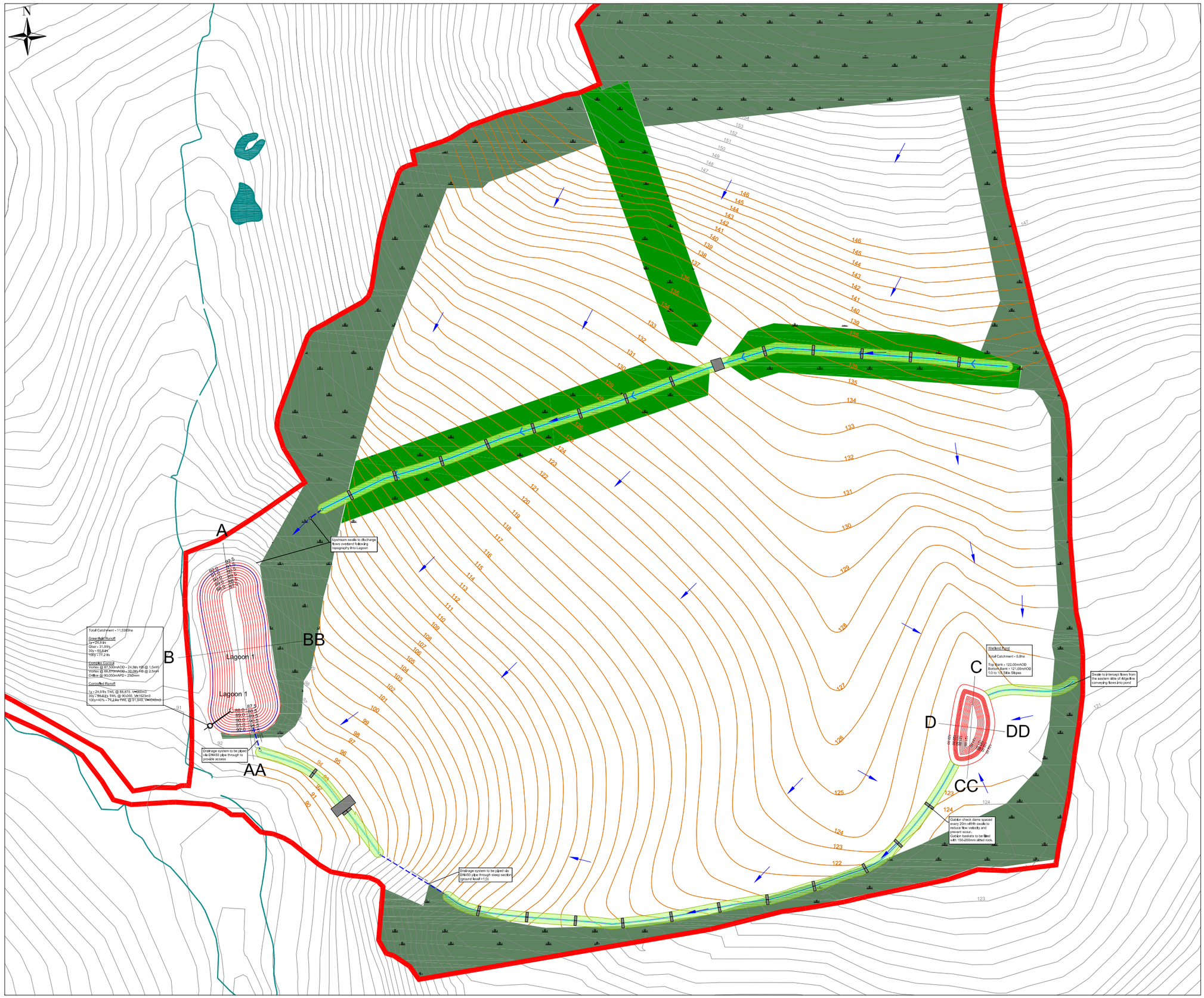
DRAWINGS



Key:

- Site Boundary
- Surface Water Features
- 100 — Existing Topographical Level Contours (including contour changes for drainage lagoons) (m AOD)
- 100 — Proposed Contours (mAOD)
- Drainage Swale
- 100 — Lagoon Topographical Level Contours (m AOD)
- 100 — Lagoon Water Level Contours (m AOD)
- Headwall to Manhole Drainage Outlets
- Headland (Lowland Meadow Habitat) Buffer Zone
- Headland (Neutral Grassland Habitat) Buffer Zone
- Culvert
- Drainage Flow

Lagoon Details		
ID	Water Level (mAOD)	Water Volume (m^3)
Lagoon 1	90.68	69
Wetland Pond	~121.5	~55

Rev.	Details	Drawn / Chkd.	Date

Project

213189
Lower Hare Farm

Title

Permanent Drainage Solution

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Environmental Consultants

Scale	Date	Drg. No.	Rev.
1:1,500@A3	Apr'22	213189/PL/D/010	
	Drawn: KW / Chkd.: ML		

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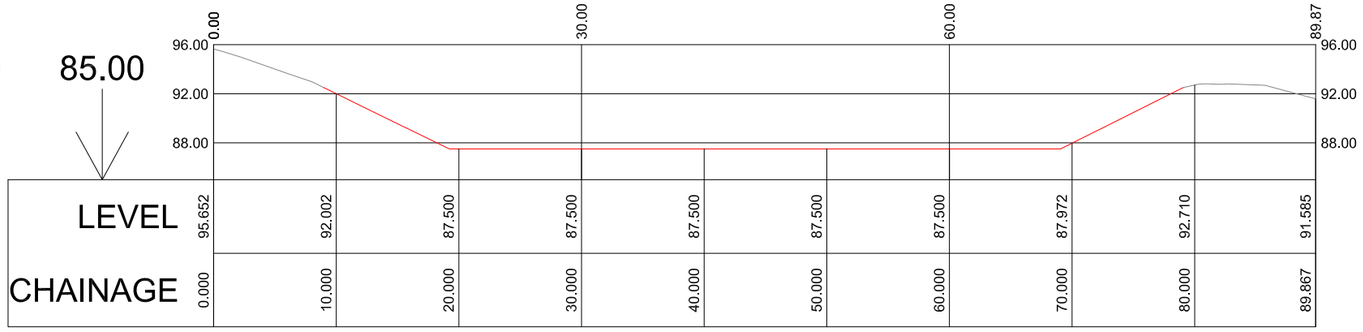
Vert. 1:500



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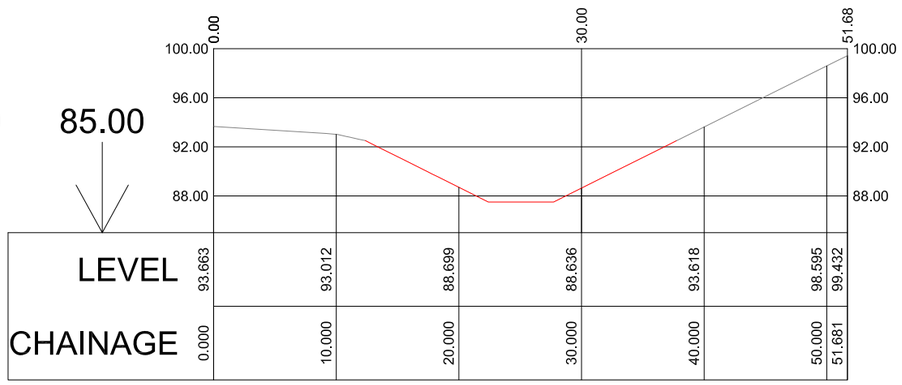
Vert. 1:500



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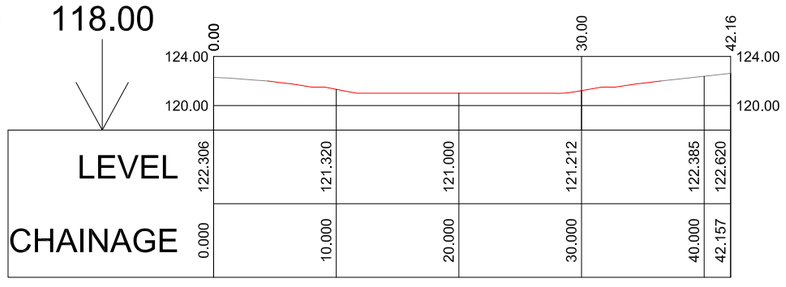

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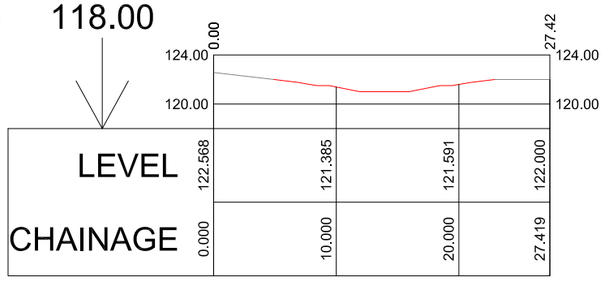

Key:

Lagoon Level (mAOD)

Ground Level (mAOD)

Rev.	Details	Drawn / Chkd.	Date

Project

213189
Lower Hare Farm

Title

Permanent Drainage Solution
Lagoon Cross-Sections

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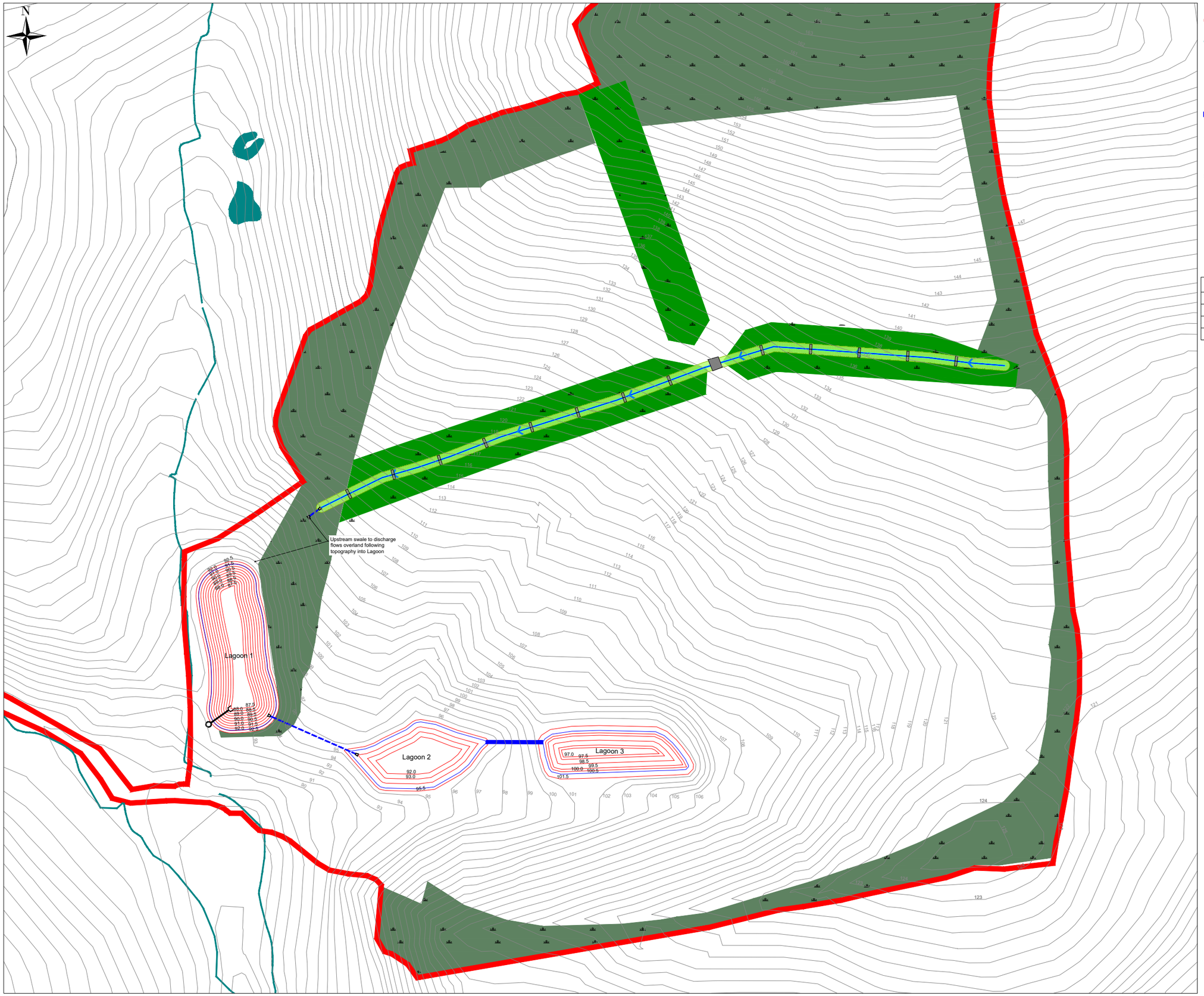
Scale	Date	Drg. No.	Rev.
1:500@A3	Apr'22	213189/PL/D/011	

Drawn	Chkd.
KW	ML



Key:

- Site Boundary
- Surface Water Features
- Existing Topographical Level Contours (including contour changes for drainage lagoons) (m AOD)
- Permanent Drainage Swale
- Temporary Drainage Swale
- Lagoon Topographical Level Contours (m AOD)
- Lagoon Water Level Contours (m AOD)
- Headwall to Manhole Drainage Outlets
- Headland (Lowland Meadow Habitat) Buffer Zone
- Headland (Neutral Grassland Habitat) Buffer Zone
- Culvert
- DN450 Twinwall Pipe

Lagoon Details		
ID	Water Level (mAOD)	Water Volume (m^3)
Lagoon 1	91.95	4,040
Lagoon 2	95	1849
Lagoon 3	100.5	1486

Rev.	Details	Drawn / Chkd.	Date

Project

213189
Lower Hare Farm

Title

Temporary Drainage Solution

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Scale	Date	Drg. No.	Rev.
1:1,500@A3	Apr'22	213189/PL/D/012	
	Drawn: KW / Chkd.: ML		

APPENDIX A
Drainage Calculations

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 502 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	89.718	2.218	0.0	59.9	59.9	1307.6	O K
30 min Summer	90.149	2.649	0.0	60.7	60.7	1715.9	O K
60 min Summer	90.612	3.112	0.0	61.5	61.5	2216.3	O K
120 min Summer	91.083	3.583	0.0	67.4	67.4	2793.1	O K
180 min Summer	91.347	3.847	0.0	70.4	70.4	3146.9	O K
240 min Summer	91.519	4.019	0.0	72.4	72.4	3390.4	O K
360 min Summer	91.725	4.225	0.0	74.6	74.6	3694.3	O K
480 min Summer	91.837	4.337	0.0	75.7	75.7	3864.2	O K
600 min Summer	91.902	4.402	0.0	76.4	76.4	3966.8	O K
720 min Summer	91.949	4.449	0.0	76.9	76.9	4039.6	O K
960 min Summer	91.940	4.440	0.0	76.8	76.8	4026.2	O K
1440 min Summer	91.870	4.370	0.0	76.1	76.1	3916.6	O K
2160 min Summer	91.708	4.208	0.0	74.4	74.4	3668.3	O K
2880 min Summer	91.532	4.032	0.0	72.5	72.5	3408.3	O K
4320 min Summer	91.156	3.656	0.0	68.3	68.3	2888.7	O K
5760 min Summer	90.818	3.318	0.0	64.2	64.2	2460.5	O K
7200 min Summer	90.499	2.999	0.0	60.7	60.7	2088.0	O K
8640 min Summer	90.144	2.644	0.0	60.7	60.7	1710.6	O K
10080 min Summer	89.860	2.360	0.0	60.4	60.4	1436.1	O K
15 min Winter	89.718	2.218	0.0	59.9	59.9	1307.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	166.670	0.0	1941.1	168
30 min Summer	102.030	0.0	2393.3	180
60 min Summer	62.459	0.0	3209.8	200
120 min Summer	38.235	0.0	3893.7	236
180 min Summer	28.694	0.0	4372.4	276
240 min Summer	23.406	0.0	4753.6	318
360 min Summer	17.566	0.0	5358.2	410
480 min Summer	14.329	0.0	5840.9	500
600 min Summer	12.235	0.0	6249.7	570
720 min Summer	10.753	0.0	6608.0	636
960 min Summer	8.609	0.0	7086.3	770
1440 min Summer	6.293	0.0	7825.6	1044
2160 min Summer	4.600	0.0	9194.3	1452
2880 min Summer	3.682	0.0	9843.6	1856
4320 min Summer	2.661	0.0	10727.5	2644
5760 min Summer	2.114	0.0	12481.9	3408
7200 min Summer	1.768	0.0	13047.5	4168
8640 min Summer	1.527	0.0	13533.8	4840
10080 min Summer	1.350	0.0	13962.8	5504
15 min Winter	166.670	0.0	1941.1	168

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	90.149	2.649	0.0	60.7	60.7	1715.8	O K
60 min Winter	90.611	3.111	0.0	61.5	61.5	2215.1	O K
120 min Winter	91.080	3.580	0.0	67.4	67.4	2789.1	O K
180 min Winter	91.345	3.845	0.0	70.4	70.4	3143.8	O K
240 min Winter	91.519	4.019	0.0	72.3	72.3	3389.4	O K
360 min Winter	91.728	4.228	0.0	74.6	74.6	3698.6	O K
480 min Winter	91.840	4.340	0.0	75.8	75.8	3869.1	O K
600 min Winter	91.900	4.400	0.0	76.4	76.4	3962.7	O K
720 min Winter	91.934	4.434	0.0	76.7	76.7	4016.7	O K
960 min Winter	91.902	4.402	0.0	76.4	76.4	3966.6	O K
1440 min Winter	91.777	4.277	0.0	75.1	75.1	3772.1	O K
2160 min Winter	91.521	4.021	0.0	72.4	72.4	3393.3	O K
2880 min Winter	91.250	3.750	0.0	69.3	69.3	3013.8	O K
4320 min Winter	90.690	3.190	0.0	62.5	62.5	2307.4	O K
5760 min Winter	90.077	2.577	0.0	60.6	60.6	1644.3	O K
7200 min Winter	89.597	2.097	0.0	59.2	59.2	1202.2	O K
8640 min Winter	89.301	1.801	0.0	55.7	55.7	962.5	O K
10080 min Winter	89.141	1.641	0.0	51.6	51.6	842.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	102.030	0.0	2393.3	180
60 min Winter	62.459	0.0	3209.8	200
120 min Winter	38.235	0.0	3893.7	236
180 min Winter	28.694	0.0	4372.4	278
240 min Winter	23.406	0.0	4753.6	320
360 min Winter	17.566	0.0	5358.2	414
480 min Winter	14.329	0.0	5840.9	508
600 min Winter	12.235	0.0	6249.7	594
720 min Winter	10.753	0.0	6608.0	664
960 min Winter	8.609	0.0	7086.3	808
1440 min Winter	6.293	0.0	7826.0	1108
2160 min Winter	4.600	0.0	9194.3	1544
2880 min Winter	3.682	0.0	9843.6	1968
4320 min Winter	2.661	0.0	10727.5	2776
5760 min Winter	2.114	0.0	12482.0	3488
7200 min Winter	1.768	0.0	13047.5	4104
8640 min Winter	1.527	0.0	13533.8	4704
10080 min Winter	1.350	0.0	13962.9	5312

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 285550 93300 SX 85550 93300
C (1km)	-0.025
D1 (1km)	0.407
D2 (1km)	0.342
D3 (1km)	0.314
E (1km)	0.280
F (1km)	2.510
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Model Details

Storage is Online Cover Level (m) 92.500

Infiltration Basin Structure

Invert Level (m) 87.500 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	318.0	2.000	826.0	4.000	1435.0
1.000	559.0	3.000	1118.0	5.000	1777.0

Complex Outflow Control

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0212-2490-1500-2490
Design Head (m)	1.500
Design Flow (l/s)	24.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	212
Invert Level (m)	87.500
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	24.9
Flush-Flo™	0.455	24.9
Kick-Flo®	1.000	20.5
Mean Flow over Head Range	-	21.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	22.4	3.000	34.7	7.000	52.3
0.200	20.5	1.400	24.1	3.500	37.4	7.500	54.0
0.300	24.2	1.600	25.7	4.000	39.9	8.000	55.8
0.400	24.8	1.800	27.2	4.500	42.2	8.500	57.4
0.500	24.8	2.000	28.6	5.000	44.4	9.000	59.0
0.600	24.6	2.200	29.9	5.500	46.5	9.500	60.6
0.800	23.6	2.400	31.2	6.000	48.5		
1.000	20.6	2.600	32.4	6.500	50.4		

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0215-3000-2500-3000
Design Head (m)	2.500
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	215
Invert Level (m)	88.870
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.500	30.0
Flush-Flo™	0.727	30.0
Kick-Flo®	1.529	23.7
Mean Flow over Head Range	-	26.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.3	1.200	28.3	3.000	32.7	7.000	49.2
0.200	21.0	1.400	26.1	3.500	35.2	7.500	50.9
0.300	26.4	1.600	24.2	4.000	37.6	8.000	52.5
0.400	28.2	1.800	25.6	4.500	39.8	8.500	54.1
0.500	29.2	2.000	26.9	5.000	41.8	9.000	55.6
0.600	29.8	2.200	28.2	5.500	43.8	9.500	57.1
0.800	29.9	2.400	29.4	6.000	45.7		
1.000	29.4	2.600	30.5	6.500	47.5		

Orifice

Diameter (m) 0.025 Discharge Coefficient 0.600 Invert Level (m) 90.050

APPENDIX B
BRE Infiltration Test Result

soil scientist

LOWER HARE FARM

EX4 2HW

Soakaway Testing

Testing is accurate at the time and place of testing. No responsibility can be taken for variations in ground conditions beyond the locations of tests undertaken.

Contents

Testing and report completed by

Steven Philp BSc Hons, CRWM, M.I Soil Sci
Soil Scientist Ltd

Report Number 0109

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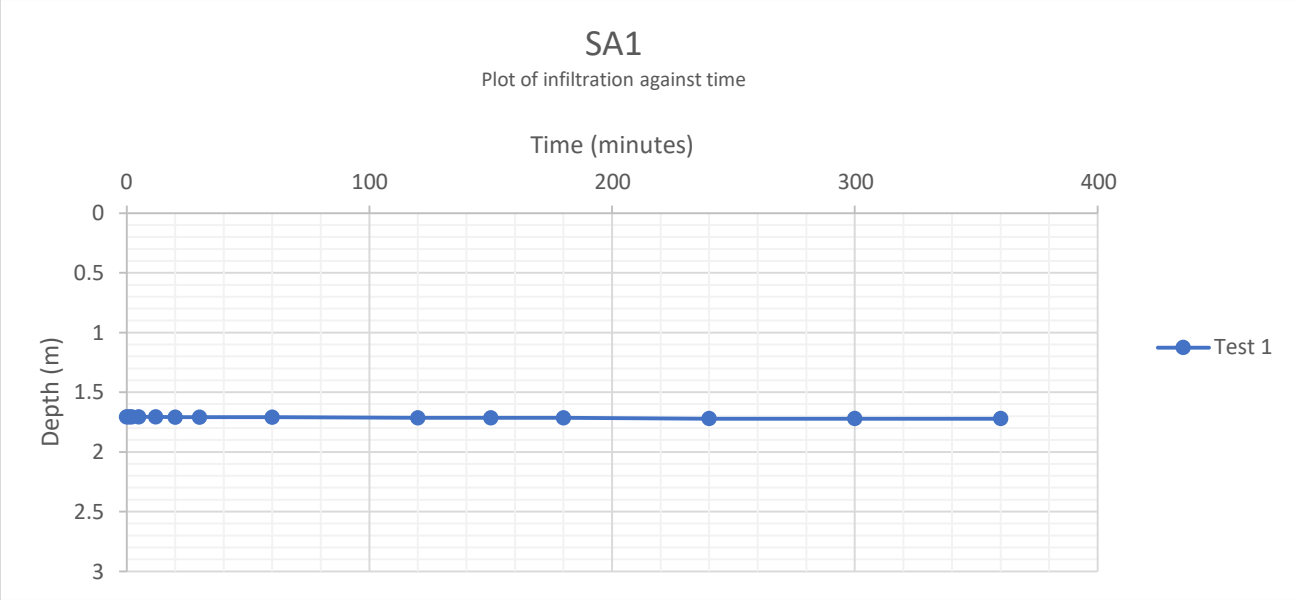
Lower Hare Farm
Soakaway Testing in accordance with BRE365

soil scientist



	Test 1 (24.03.22)		
Total pit depth at start of test (m)	**3.10**	-	-
Total pit depth at end of test (m)	**3.10**	-	-
Effective Depth, De (m)	**1.40**	-	-
Effective Storage Volume, V_{p75-25} (m^3)	**0.66**	-	-
Surface Area, a_{p50} (m^2)	**4.65**	-	-
Time, t_{p75-25} (seconds)	**NA**	-	-
Infiltration rate, f (m/s)	**NA**	-	-

Depth	Soil Description
0 – 0.2m	Brown sandy slightly gravelly CLAY with many rootlets. (TOPSOIL)
0.2 – 0.5m	Grey slightly sandy gravelly CLAY, with occasional roots. Gravels are brick, concrete, and metal fragments. (MADE GROUND)
0.5 – 0.75m	Greyish brown stiff to firm CLAY
0.75 – 2.20m	Yellowish grey stiff to firm CLAY
2.2 – 3.1m	Yellowish grey stiff to firm gravelly CLAY. Gravels are fine to coarse subangular sandstone, ironstone, and quartz.

Notes:

No groundwater was encountered in the pit.

Weather was Sunny.

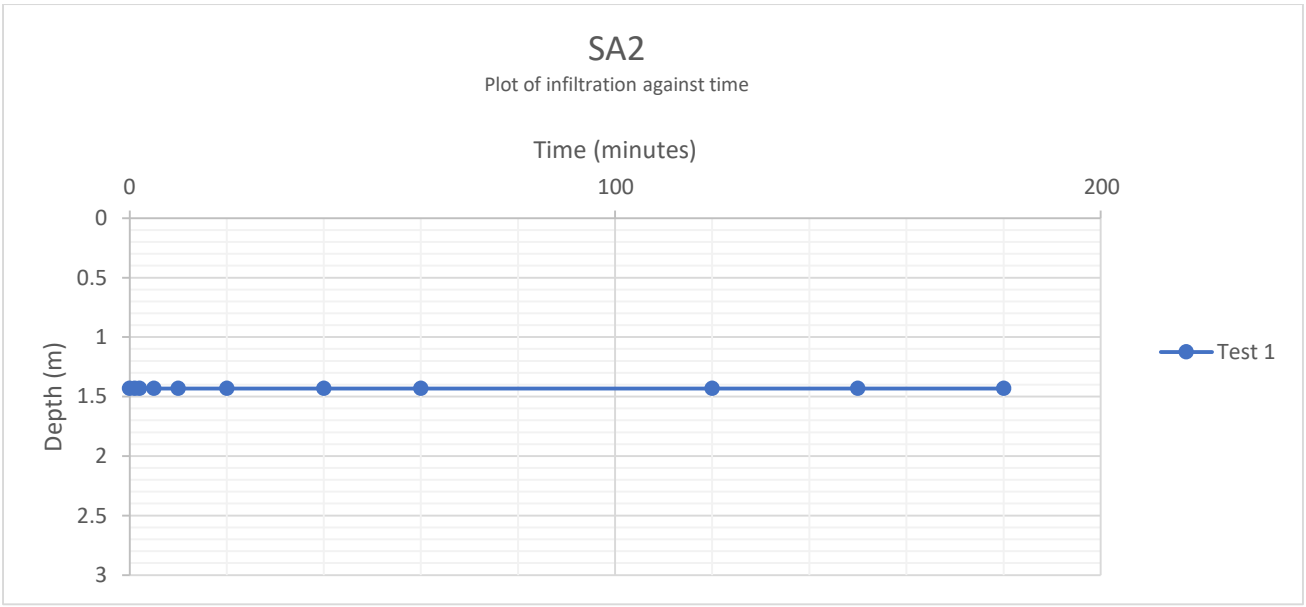
Pit was dug with a 14T excavator.

Pit was filled using a 1,000Ltr water bowser.

Pit dimensions: **L 1.9m x W 0.5m x D 3.1m**

NGR**: 285619, 093282**

Unable to calculate an infiltration rate due to insufficient drainage.



	Test 1 (24.03.22)		
Total pit depth at start of test (m)	**3.00**	-	-
Total pit depth at end of test (m)	**3.00**	-	-
Effective Depth, De (m)	**1.57**	-	-
Effective Storage Volume, V_{p75-25} (m^3)	**0.82**	-	-
Surface Area, a_{p50} (m^2)	**2.79**	-	-
Time, t_{p75-25} (seconds)	**NA**	-	-
Infiltration rate, f (m/s)	**NA**	-	-

Depth	Soil Description
0 – 0.2m	Brown sandy slightly gravelly CLAY with many rootlets. (TOPSOIL)
0.2 – 0.5m	Grey slightly sandy gravelly CLAY, with occasional roots. Gravels are brick, concrete, and metal fragments. (MADE GROUND)
0.5 – 2.2m	Yellowish grey stiff to firm slightly gravelly CLAY. Gravels are fine to coarse subangular sandstone, ironstone, and quartz.
2.2 – 3m	Grey friable CLAY / weathered shale.

Notes:

No groundwater was encountered in the pit.

Weather was Sunny.

Pit was dug with a 14T excavator.

Pit was filled using a 1,000Ltr water bowser.

Pit dimensions: **L 2.1m x W 0.5m x D 3.0m**

NGR**: 285649, 093288**

Unable to calculate an infiltration rate due to insufficient drainage.

Comment **SA1**	**Project** LHF
	Photo Plate 1
	Date 24/03/22
	Originator S.Philp

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Comment **SA2**	**Project** LHF
	Photo Plate 2
	Date 24/03/22
	Originator S.Philp

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UK Grid
Reference Finder

Grid Reference	X (Eastings)	Y (Northings)	Latitude	Longitude	Description (Click to Edit)	Address	Postcode	Link	Center	Zoom	Styl (clic cha
SX 85619 93282	285619	093282	50.727866	-3.6219651	SA1	Hare Lane, Whitestone, Teignbridge, Devon, South West En	EX4 2HW				
SX 85649 93288	285649	093288	50.727922	-3.6215408	SA2	Hare Lane, Whitestone, Teignbridge, Devon, South West En	EX4 2HW				