Egdon Resources U.K. Limited

Wressle Wellsite

Surface Water Management Plan

Revision 1

April 2024

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1. INTRODUCTION

Egdon Resources U.K. Limited (Egdon) is a subsidiary of Egdon Resources PLC, which was formed in 1997, awarded its first licence in 1998 and gained its first operated licence in 2000. Under the Petroleum Licensing system this permits the licence holder to 'search and bore for and get petroleum within the licence boundary' subject to the granting of planning permission, in accordance with the Town and Country Planning Act 1990.

Egdon is engaged in the exploration and production of petroleum onshore United Kingdom and holds 30% in the Petroleum Exploration and Development Licence 180 (PEDL 180). Within PEDL 180, Egdon Resources, as the operator, have successfully drilled, tested and produced hydrocarbons from the Wressle-1 well.

The Wressle Wellsite has historically been the subject of a number of permit applications and variations, as summarised within the table below.

Permitted Activities				
Permit	Ref.	Description	Activity	EPR2016
EPR/AB3609XX	A1	Loading, unloading, handling or storage of crude oil.	Installation	Schedule 1
	A2	Non-hazardous mining waste operation	Mining Waste	Schedule 20
	A3	Non-hazardous mining waste facility		
	A4	Groundwater activity for a single injection.	Groundwater	Schedule 22
	A5	Discharge of rainfall run off water to Ella Beck	Water Discharge	Schedule 21
	A6	Operate a Medium Combustion Plant.	MCP and SG	Schedule 25
EPR/HB3295DH	A1	Accumulation of radioactive waste on the premises.	Radioactive Substances	Schedule 23

2. SCOPE

This Surface Water Management Plan (SWMP) is applicable to the Wressle Wellsite and all operations conducted therein. It is applicable to Egdon, its contractors and subcontractors and can be used in support of an application to the Environment Agency under EPR2016, where there is a requirement to provide a Non-Technical Summary.

3. DEFINITION

AOD	Above Ordnance Datum
EPR2016	Environmental Permitting (England and Wales) Regulations2016
HDPE	High Density Polyethylene
FEH	Flood Estimation Handbook
M^3	Meters Cubed
Mm/hr	Millimetres per hour
PEDL	Petroleum Exploration and Development Licence
SWMP	Surface Water Management Plan

4. DESCRIPTION OF THE FACILITY

4.1 Development Location

The Wressle wellsite and the water discharge activity will be undertaken at the following location:

Wressle Wellsite
Lodge Farm
Clapp Gate
Broughton and Appleby
DN15 0DB

National Grid Ref: Easting: 496772
Northing: 411102

Figure 4.1: Permitted Boundary (Source: Google Earth May 2020)

4.2 Flood Zone Setting

The Wressle wellsite is 5m above Ordnance Survey Datum and flooding by encroaching sea is not considered a realistic risk, although high water flows coincident with high tides could result in a flood risk. In a similar way, there are no sewers within the locality and so the potential of flooding from this source is very low.

A review of the Flood Risk Planning Map has confirmed that the wellsite and the proposed discharge location fall within a 'Flood Zone 1' category, that is an area considered to pose little or no risk with an annual probability of flooding from rivers and sea of less than 0.1%.

5. CONTAINMENT SYSTEM

5.1 Surface Water Containment System (Active Area)

The Wressle wellsite is constructed with a 2mm HDPE impermeable liner so as to ensure that any surface water or spillages are contained within the wellsite. Surface water (rainwater) collected within the active area of the wellsite will flow down a slight gradient to the active area containment ditch.

Surface water is discharged to the nearby Ella Beck surface water course via an installed Class 1 Oil Separator during period of normal operations i.e. production or suspension. Egdon consider the risk of contamination during normal operations as being low when compared to that of workovers or other exploratory operations, due to all hazardous substances being contained within a secondary containment system.

During periods of workover or well intervention operations i.e. nonstandard operations, the inlet and outlet valves to/from the interceptor are locked 'closed' and water within the containment system is collected via a vacuum tanker and subsequently treated at a waste water treatment facility.

Water gathering on the concrete internal roadway will run off onto the stone on the main site. A sump has been installed, with a raised kerb, to capture any slight spillages from tanker loading, this will be transferred to the containment bund. See section 5.3.

A cross section of the installed wellsite containment structure has been provided below in Figure 5.1.

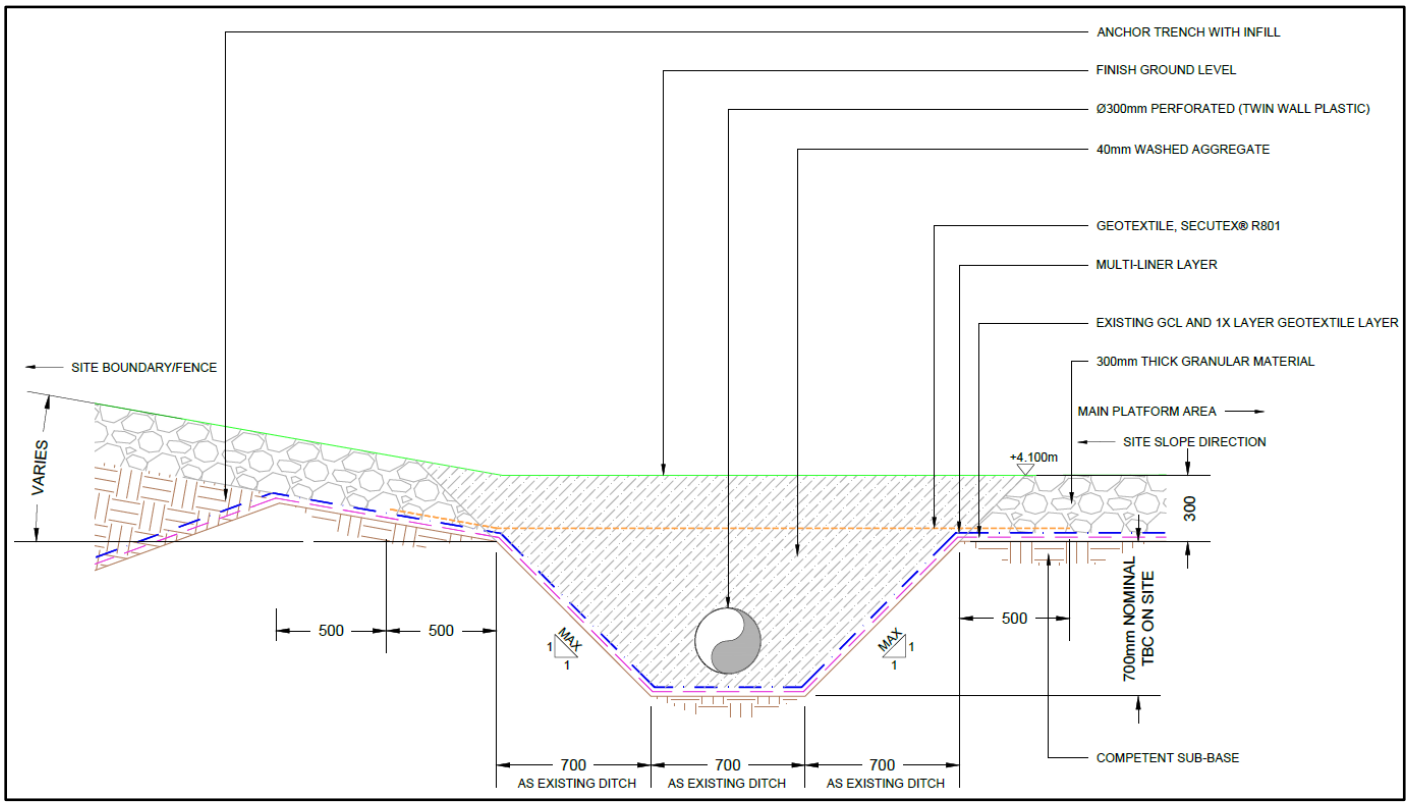

Figure 5.1: Proposed Drainage System Cross Section

The site encompasses a small fall from the centre of the site to the perimeter of the active area, so as to ensure that any surface water percolates through the site stone and once intercepted by the HDPE liner flows by gravity to the containment ditch. The HDPE Carbofol impermeable membrane has been fully installed in accordance with an approved Construction Quality Assurance Plan (CQA) and guidelines contained in the Environment Agency document LFE4[1].

[1] LFE4 - Earthworks in Landfill Engineering and specifically Chapter 6 - Construction Quality Assurance (CQA).

Once within the containment system water flows towards the northeast corner of the site, through the interceptor and into an outflow pipe with a discharge point at the Ella Beck surface watercourse. A penstock valve limits the discharge rate to permit a maximum flow of 5l/s.

The site will be extended, subject to grant of Planning Permission, to facilitate 2 additional wells. The existing tertiary containment system together with the existing perimeter containment ditch system and containment bunding will be extended to accommodate the proposed extension.
Stormwater storage calculations have been undertaken for the extended wellsite platform (6,900 m^2). Accounting for the bunded storage areas and making an allowance for plant and machinery that will be present at the Site during the development of the new wells, the platform area available for stormwater storage is 5,700 m^2. This equates to a volumetric storage capacity of 1.708m^3
The calculations demonstrate that the extended wellsite platform can contain in excess of a critical 7 day, 1 in 100-year event plus 40% climate change storm event. During well construction activities, stormwater will be wholly contained either within the containment ditch or above the finished surface level, with the top water level not exceeding the height of the perimeter bunding (minimum 300 mm). The water level during a 7 day, 1 in 100-year event plus 40% storm event is calculated to be a shallow depth of 0.188 m (188 mm).

5.2 Surface Water Containment System (Bunded Areas)

Surface water collected within containment bunds, such as the one containing the storage tanks, will activate a detection alarm once levels of water reach a certain threshold. Once the alarm has been triggered a pump will subsequently activate and pump water into a dedicated storage tank (contained within the same bund). The storage tank and/or bund shall be emptied via a vacuum tanker directly. Surface water captured within the bunded area and dedicated storage tank shall not be released to containment ditches or the surface water receptor.

The storage bund was constructed using reinforced concrete with the purpose of up to six (6) storage tanks. The measurements of the bund (27.60m x 15.00m x 0.45m) have been calculated so as to ensure compliance with CIRIA C736[2] to determine the containment requirements of the bund. The calculations are as follows: -

Case 1: 25% of the Total Tank Volume

4 x 70,000L Tanks = 280,000L or 280m^3

1 x 63,000L Tanks = 63,000L or 63m^3

1 x 22,260L Tanks = 22,260L or 22.26m^3 (Bund overflow tank only)

Total Tank Volume = 365.6m^3 @25% = **91.315m^3**

Case 2: 110% of the Largest Tank Volume

1 x 70,000L Tanks = 70,000L or 70m^3@110% = **77m^3**

An allowance for a 1 in 100-year storm +5% from the latest FEH Rainfall Data = **61m^3**

Case 1: 91.315m^3 + 61m^3 = **152.315m^3**

Case 2: 77m^3 + 61m^3 = **138m^3**

Actual Volume Provided as Constructed= 27.6m^3 x 15m^2 x 0.45m = **186.3m^3**

The bund has been designed to be fluid containing and any joints in the concrete have water bars or hydrophilic strips in order to inhibit the passage of liquids.

[2] CIRIA Guide C736- Containment Systems for the Prevention of Pollution.

The bund base has been designed to accommodate the loading of the proposed tanks, in accordance with concrete society report TR34 - Edition 4th[3].

6. Discharge to Surface Water

6.1 Greenfield Runoff Rate

The Civil Structure and Design Statement produced in support of a planning application has confirmed the rate at which the discharge can take place from the site into Ella Beck without incurring localised flooding.

A Rainfall intensity of (1mm/hr) for 2-year, 30-year and 100-year return periods, 60-minute storm was calculated using the Micro-Drainage (Windes) software modelling based on Flood Estimation Handbook (FEH) rainfall data.

The performance of the containment system was assessed against the 100-year event, including a 5% increase in rainfall rates to allow for climate change. Various scenarios have been tested, to ensure the system based on a maximum out flow of 5l/s to Ella Beck can attenuate the appropriate volumes within the bunded platform area.

Detailed proposed surface water drainage modelling was carried out based on FEH rainfall to ensure that the proposed infrastructure can accommodate the predicted flows and any flood waters being retained within the platform. Windes Hydraulic Simulation Results have been presented within Appendix 1.

To ensure that a maximum discharge of 5l/s is achieved surface water flows through a penstock valve, designed to achieve such rates.

6.2 Control of Discharges

Only the appointed person(s) has access to the isolation valves and subsequently ‘open’ and ‘close’ the discharge as dictated by the site operations and the results of any sampling and analysis as described below.

6.2.1 Normal Operations

During periods of production or where there is no activity at site, the interceptor remains ‘open’ so as to allow surface water (rainfall) on the site to discharge into the surface water course, preventing the build-up of levels within the containment system and preventing flooding of the site when is unmanned.

Water is discharged from the perimeter containment ditch to the outflow pipe and Ella Beck on the north-eastern boundary of the wellsite via a Class 1 SPEL Oil-water Separator (herein referred to as an interceptor). The interceptor is designed, manufactured and tested in accordance with the European Standard BS EN 858-1.

The discharge arrangement means there is a negligible risk that free phase hydrocarbons would be present in the discharge; however, the interceptor does provide an additional level of environmental protection. The specification of the interceptor is provided in Appendix 2. The interceptor will be fitted with a high fluid level alarm system so as to warn the Operator to close the isolation valves and arrange for servicing of the interceptor preventing any potential hydrocarbons from being discharged to the surface water course.

The interceptor is subject to checks on a daily basis including viewing of the inspection chamber for any signs of visible oil/grease i.e. surface film.

Although the site may conduct production operations 24 hours a day, it may not be manned as such. The production site has been designed and engineered so as to significantly reduce the likelihood of a pollution event occurring offsite.

A risk assessment has been provided to demonstrate the likelihood of an onsite pollution event at the unmanned Wressle wellsite resulting in an offsite pollution event. The results are presented within Appendix 4 and demonstrate that the mitigation measures installed at the site are suitable in preventing an offsite pollution event.

6.2.2 Nonstandard Operations

[3] TR34 - Edition 4th Concrete Industrial Ground Floors.

Where site activities differ from production and periods of no activity the interceptor shall remain 'closed' so as to prevent rainwater (potentially containing pollutants associated with the operations) from entering the surface water system. Due to the nature of operations such as workovers, completions and drilling at onshore oil and gas facilities there is a significant increase in the likelihood of an onsite pollution event occurring at the wellsite, not least due to increase use of chemicals and the increased risk of human error as a result of more people working on the site.

During nonstandard operations any rainfall captured within the active area of the wellsite shall collected within the site containment system pending collection by a licenced waste carrier (vacuum tanker) and subsequently treated at an Environment Agency permitted waste water treatment facility.

Following the cessation of nonstandard operations and removal of any additional equipment and chemicals at site it is considered that the site has resumed normal operations. However, the isolation valves remain 'closed' for a period so as to prevent any discharges of collected rainwater as it may still be contaminated as a result of the nonstandard operations.

The Ella Beck is subject to water sampling and analysis in accordance with the frequency and parameters as specified within the Environmental Permit. The discharge from the interceptor is also subject to analysis; all sampling is undertaken by a specialist third-party and a separate laboratory is used for testing. Should the sampling and analysis regime identify that the surface water has become contaminated or is not suitable for discharge, then the interceptor valves will be closed and all waters will be retained within the containment system. Additional sampling and analysis may be undertaken and then the retained surface water shall be collected by a licenced waste carrier (vacuum tanker) and subsequently treated at an Environment Agency permitted waste water treatment facility. An inspection of the containment ditch and site surface shall take place to identify any evidence of contaminated areas and remedy them as appropriate. In the event of any significant anomalies within the analysis results, the Environment Agency will be informed and an agreed process will be implemented which may include increasing or repeating the sampling and analysis process, and preventing any releases to surface water subject to Environment Agency approval.

7. SAMPLING AND ANALYSIS

7.1 Ella Beck

Ella Beck is currently the subject of a sampling and analysis regime dictated by the existing environmental permit. The location and parameters associated with the monitoring regime shall not differ from the existing arrangement approved within the permit. However, Egdon has approval from the Environment Agency to reduce the frequency of monitoring during extended periods of normal operations, specifically reducing from a monthly to a 3 monthly arrangement. In addition, monitoring of the discharge from the interceptor is undertaken at the same frequency. Samples are taken from the inspection chamber for this purpose.

7.1.1 Location

Surface water monitoring on Ella Beck on at least three locations as follows:

- 1 location within 200m upstream of the site;
- 1 location around the area adjacent to the midpoint of the site boundary riparian to the watercourse; and
- 1 location within 200m downstream of the site.

7.1.2 Frequency

The monitoring frequency at Ella Back is as follows:

- Once prior to the commencement of nonstandard operations;
- Weekly during periods of nonstandard operations;
- Immediately after the cessation of nonstandard operations; and
- Quarterly thereafter

7.1.3 Parameters

- Ammoniacal Nitrogen
- Arsenic
- Barium
- Boron
- Cadmium
- Calcium
- Chloride
- Total Chromium
- Copper
- Lead
- Magnesium
- Mercury
- Nickel
- Potassium
- Selenium
- Sodium
- Zinc
- pH
- PAH
- TPH
- BTEX
- TSS
- Electrical Conductivity
- Calcium Carbonate

7.2 Perimeter Containment System

Covered under the sampling process as described for the interceptor discharge. In the event that analysis results from the interceptor discharge indicate significant deviations from the “normal” results, sampling and analysis may be applied to waters within the containment ditch system.

7.2.1 Location

Samples will be collected from the inspection chamber located immediately prior to interceptor, or from the ditch inspection chamber.

7.2.2 Frequency

The monitoring at the site shall take place as follows:

- Following the cessation of nonstandard operations at the site once all associated equipment and substances have been removed.

- Repeated as necessary following until such time whereby the results have been considered to fall within the appropriate standards.

7.2.3 Parameters

- Ammoniacal Nitrogen
- Arsenic
- Barium
- Boron
- Cadmium
- Calcium
- Chloride
- Total Chromium
- Copper
- Lead
- Magnesium
- Mercury
- Nickel
- Potassium
- Selenium
- Sodium
- Zinc
- pH
- PAH
- TPH
- BTEX
- TSS
- Electrical Conductivity
- Calcium Carbonate

7.3 Sampling Methodology

The steps below outline how the appointed person shall collect suitable samples and package them as required.

1. All sampling equipment shall be clean, sanitised and in working order prior to use.
2. Handheld meters, if used shall be within their calibration date and have sufficient power supply.
3. Suitable sampling locations shall be identified, ideally fixed and marked as the sample spot for consistency. Appendix 3 contains a location plan for the Ella Beck monitoring locations.[4]
4. Water shall be visually inspected and the following details shall be recorded:
   a. Depth of water;
   b. Signs of oil / grease;
   c. Date and time; and
   d. Weather Conditions;
5. Nitrile Gloves shall be applied and sample containers marked-up as necessary detailing the following:
   a. Client Name for Laboratory (Egdon Resources U.K. Limited or Appointed Contractor)
   b. Location (Wressle Wellsite)
   c. Sample Identification; and
   d. Date and time sample taken.
6. The sample shall be collected in the centre of watercourse and inspection chamber, below the surface layer. Caution must be taken when sampling in shallow water that debris from the bottom is not disturbed. If disturbance occurs, the sample should be disregarded and retaken.
7. Sample bottles shall be filled completely, so as to removed air when the top is screwed on, unless otherwise stated by the laboratory. Water bottles shall be filled on a flat clean surface.
8. Sample bottles shall be placed into the cool box provided.
9. Beakers shall be filled and hand probes used to measure field water chemistry parameters (pH, electrical conductivity, temperature).
10. Paperwork shall be completed and shall accompanying the samples to the laboratory which shall arrive within 48 hours of being taken. Storage of the samples shall be suitable and include a cool box to store samples at the necessary temperatures.
11. 48 hours to reach the labs

[4] Appendix 3 also shows the initial design drawing of the site which may differ slightly from the actual built site as described within the main SWMP document.

7.4 Laboratory Analysis

Samples will be collected using specified sampling containers provided by the appointed laboratory and shall be transported to the laboratory (on the same day where possible) in a safe and suitable manner. Duplicate samples may also be taken so as to mitigate against unsuitable or failed samples. Laboratories undertaking testing shall be at least UKAS accredited.

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APPENDIX 1 - WINDES HYDRAULIC SIMULATION RESULTS

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 545000 375450 TF 45000 75450
C (1km)	-0.022
D1 (1km)	0.369
D2 (1km)	0.284
D3 (1km)	0.242
E (1km)	0.307
F (1km)	2.440
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Storage Structures for Storm

Filter Drain Manhole: 1, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.300
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.20	Slope (1:X)	0.0
Invert Level (m)	3.300	Cap Volume Depth (m)	0.700
Trench Width (m)	1.4	Cap Infiltration Depth (m)	0.000
Trench Length (m)	121.5		

Filter Drain Manhole: 2, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.300
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.20	Slope (1:X)	0.0
Invert Level (m)	3.300	Cap Volume Depth (m)	0.700
Trench Width (m)	1.4	Cap Infiltration Depth (m)	0.000
Trench Length (m)	121.5		

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	0.127	0.071	30.685	30.883
2.000	2	0.127	0.071	30.685	30.883
1.001	3	0.127	0.044	0.000	0.171
Total		0.382	0.186	61.369	61.937

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	1	0.127	0.039	30.685	30.851
2.000	2	0.127	0.039	30.685	30.851
1.001	3	0.127	0.040	0.000	0.167
Total		0.382	0.118	61.369	61.869

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	D3 (1km)	0.242
FEH Rainfall Version	1999	E (1km)	0.307
Site Location	GB 545000 375450 TF 45000 75450	F (1km)	2.440
C (1km)	-0.022	Cv (Summer)	0.750
D1 (1km)	0.369	Cv (Winter)	0.840
D2 (1km)	0.284		

Margin for Flood Risk Warning (mm) 50.0 DVD Status ON
Analysis Timestep Fine Inertia Status ON
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	5

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	10080 Winter	100	+5%	100/15 Summer	100/15 Summer			4.302	0.702
2.000	2	10080 Winter	100	+5%	100/15 Summer	100/15 Summer			4.302	0.702
1.001	3	10080 Winter	100	+5%	100/15 Summer	100/15 Summer			4.302	0.852

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	201.792	0.01		0.6	FLOOD	38
2.000	2	201.792	0.01		0.5	FLOOD	38
1.001	3	201.901	0.00		0.0	FLOOD	38

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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Storm Duration (mins)	30

Online Controls for Storm

Orifice Manhole: 3, DS/PN: 1.001, Volume (m³): 0.2

Diameter (m) 0.051 Discharge Coefficient 0.600 Invert Level (m) 3.300

Storage Structures for Storm

Filter Drain Manhole: 1, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.300
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.20	Slope (1:X)	0.0
Invert Level (m)	3.300	Cap Volume Depth (m)	0.700
Trench Width (m)	1.4	Cap Infiltration Depth (m)	0.000
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Filter Drain Manhole: 2, DS/PN: 2.000

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Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	100
Climate Change (%)	5

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	1	480 Winter	100	+5%	100/15 Summer	100/15 Summer			4.172	0.572
2.000	2	480 Winter	100	+5%	100/15 Summer	100/15 Summer			4.172	0.572
1.001	3	480 Winter	100	+5%	100/15 Summer	100/15 Summer			4.172	0.722

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	72.390	0.14		7.9	FLOOD	34
2.000	2	72.351	0.10		5.6	FLOOD	34
1.001	3	72.035	0.46		5.0	FLOOD	38

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APPENDIX 2 - KINGSPAN NSFP006 CLASS 1 FULL RETENTION SEPARATOR

001374

NSFP003 – NSFP006 Class 1 Full Retention Separator Installation & Operation Guidelines

Kingspan Environmental Service Contact Numbers:

GB: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

Enclosed Documents

DS0992P	NSFP003 – NSFP006 Class 1 Full Retention Separator
DS1014P	NSFP003 - NSFP006 Installation Drawing
NSFPEXTzz	NSFP Neck Extension Assembly

Issue	Description	Date
05	CC1405 – Coalescer Extension Chains were Pipes	February 2018

CONTENTS

1 Introduction

1.1.1 These Guidelines represent Best Practice for the installation of the above Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, any information or advice given by our employees or agents regarding the design of an installation must be verified by a qualified specialist (e.g. Civil engineering consultant).

1.1.2 For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines pollution prevention guidelines No. 3 (PPG3).and BS EN 858. Our units have been independently tested by BSI and are certified as meeting the standards.

1.2 Handling & Storage

1.2.1 Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it cannot fall and become damaged

1.2.2 The design requirements of these products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

1.2.3 When lifting units, use webbing slings of a suitable specification. Do not use chains.

1.2.4 A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.

1.2.5 Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

1.2.6 We accept no responsibility for the selection of lifting equipment.

1.2.7 Whenever units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat, and level and the unit orientated onto its side with even support. Do not roll separators.

1.3 Site Planning

The following points should be considered before installation of the equipment:

1.3.1 The discharge must have the consent of the relevant Environmental Regulator.

1.3.2 The installation should have Planning and Building Control approval.

1.3.3 Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.

1.3.4 We will fit a tube to receive the alarm probe. This tube provides protection and ensures that the probe is positioned at the correct level to sense the oil build up. The tube design and probe level setting assumes the use of our standard oil alarm system and may not be suitable for other alarm supplier’s equipment. The probe tube is fitted within the neck of the unit. It should be extended to ground level when extension necks are required. Consult the alarm supplier’s instructions for they’re detailed fitting installation instructions.

1.3.5 Consider venting of the unit. Comply with local regulations. In the UK, comply with the following regulations. For Petrol Stations: Health and Safety Guidance Note 41 (HS(G)41). For other applications: BS8301: 1985 (obsolescent) BS EN 752 Building Drainage. Adequate ventilation should be provided to the separator. The ventilation pipe should be as short as is practicable and be terminated not less than 2.5m above paving nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m. Each neck should be vented independently, we advise against joining these below ground prior to their rising as vent stacks.

1.3.6 Consider installation of a sampling point downstream of the separator. There is no suitable facility to effectively sample the wastewater from inside the unit.

1.3.7 Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)

1.3.8 Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.

1.3.9 If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.

1.3.10 The separator must be installed at a level, which will allow connection to the incoming drain and a free discharge at the system outlet. The water table must be below the discharge outlet.

1.3.11 Do not install the unit deeper than necessary, ensure that you purchase extension shaft kits. The minimum invert depth of the unit is shown on the customer drawing.

1.3.12 Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

1.3.13 There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.

1.3.14 It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

1.3.15 Provide electrical supply for alarm system. (If required)

1.3.16 Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE wiring regulations.

1.3.17 This unit is designed to operate with gravity in and out flows. The unit is not designed to operate with a pumped influent.

2 Installation

2.1 Installation - General

2.1.1 When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

2.1.2 For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.

2.1.3 The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.

2.1.4 In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the sidewalls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

2.1.5 In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.

2.1.6 During installation care must be taken to ensure that the body of the unit is uniformly supported so that point loads through the unit are avoided.

2.1.7 The Concrete Specification is not a site specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES:	C25 /30 C25 /30 C16 /20	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

2.1.8 Pea Shingle - 6 mm to 10 mm rounded pea shingle, offering low point loading characteristics is considered to be the most suitable material for back filling in dry ground installation. (PEASHINGLE ONLY TO BE USED IN DRY SITE CONDITIONS).

2.2 Separator Installation

2.2.1 **DRY GROUND CONDITIONS**

2.2.2 Excavate the site, allowing for a minimum clearance on all sides and base of the unit of 200mm and level the base.

2.2.3 Ensure that the hole is kept dry. Should any rain or surface water collect in the hole, this should be pumped out.

2.2.4 A base of at least 200mm of lean mix concrete should be provided.

2.2.5 Lower the tank in the hole using a rope sling through the lifting points provided on the tank. Under no circumstances should the sling be attached to the inlet pipe or the outlet pipe.

2.2.6 Position the inlet pipe in line with the incoming drain. Note that the inlet and the outlet pipes are clearly embossed on the tank. The unique profile of the base will help to level the tank, but make sure the tank is in the truly upright position in order to maintain the 100mm fall between the inlet and outlet pipes.

2.2.7 After any concrete in the base has taken up it's initial set (usually after one day), ballast the tank by putting approximately 0.5m depth of water into it.

2.2.8 Backfill the space around the tank with pea gravel or similar material (PEASHINGLE ONLY TO BE USED IN DRY SITE CONDITIONS). The backfill should be free from organic material, large stones, brick or sharp objects. Backfilling should be carried out in layers, making sure that voids are not left under and around the sides of the tank and that there are no localized stress concentrations. Its is most important that the installer progressively fills the tank with water to the level above the backfill in order to stabilize pressures on the tank.

2.2.9 Remove any temporary covers and connect up the tank inlet and outlet pipes to your own pipework.

2.2.10 Backfilling can now proceed up to ground level in 300mm stages ensuring tank is ballasted in all chambers as you go.

2.2.11 A galvanized lockable manhole cover (600x600mm) and frame is to be fitted to suit specific site loadings, THE TANK MUST NOT BE LOAD BEARING. The top of the manhole should not be sat below the local ground level. If necessary a further neck extension should be added to the tank to bring the cover up to ground level (see section 6).

2.2.12 Venting can be provided through the cover or a Tee piece arrangement on the outlet/inlet.

2.2.13 **WET GROUND CONDITIONS**

2.2.14 Excavate a hole to appropriate depth allowing at least 300mm for lean mix concrete and hard-core base. Allow for tank width plus at least 400mm with additional allowance for any necessary shuttering.

2.2.15 De-water the excavation using suitable pumping equipment. Ensure that the pump discharge does not saturate the ground in the immediate vicinity. In wet ground conditions the installer should ensure that the base is adequate to support the weight of the tank and its contents. If the base of the excavation is unstable, i.e. running sand or similar, excavate an additional 250-300mm below concrete levels and fill up with compacted hard-core. Place a sheet of polythene over the hard-core and up the sides of the excavation before putting in the concrete cradle.

2.2.16 Lay a bed of concrete (minimum 150mm thick) on top of the polythene at the base of the excavation. De-watering is to continue until you are satisfied that the concrete has cured.

2.2.17 Lower the tank onto the concrete bed, ensuring that the inlet and outlet are in the correct position. Ensure the tank is upright and then ballast it with water to a maximum of 500mm deep.

2.2.18 Haunch up the concrete bed at least 450mm all round the base, ensuring that all voids in the concrete are eliminated and at least 150mm of concrete is left below the tank base.

2.2.19 Backfill to the invert depth with concrete. Ensure that the water level inside the tank is maintained no more then 250-300mm above concrete backfill level. It is most important that the installer progressively fills the tank with water to a level above the backfill in order to stabilise pressure on the tank.

2.2.20 Backfill evenly all round the tank, consolidating in layers. The backfilling should start before the base has hardened and be a single continuous operation so that the tank has a full concrete jacket without joins.

2.2.21 DO NOT use vibrating pokers to consolidate concrete. DO NOT discharge concrete directly on to the tank. Ensure that the concrete is not too wet and that is tamped in around the tank.

2.2.22 Align and connect pipework.

2.2.23 Build up a shell of concrete around the neck of the tank to 150-200mm thickness before completing the backfill with a suitable material. Care must be taken to avoid distortion of the neck whilst concreting this area.

2.2.24 Fit cover and frame. Apply surface finish e.g. turf

2.2.25 Do not empty tank until the concrete backfill has cured. Tanks may be left filled with water.

2.3 Pipework Connections

2.3.1 In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings).

2.3.2 These units are fitted with **PVCu spigots** to both the outlet and the inlet.

2.3.3 Connect using the same size PVCu socket or a suitable reducer.

2.3.4 Ensure that the connecting pipework seal is secure and watertight before backfilling the pipe.

2.3.5 Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework. When using this connection method, ensure that the seal is secure before backfilling the pipe. If purchasing a flexseal coupling for use with clay /concrete, we suggest that a size 110 mm larger than the ID is selected.

2.4 Oil Level Alarm & Neck Fitting

2.4.1 We will fit a tube to receive the oil alarm probe. This provides protection and ensures that the probe is positioned at the correct level to sense oil build up.

2.4.2 See alarm supplier information and ensure that the probe is placed within the tube and can be accessed from ground level.

2.4.3 Continue backfilling with concrete/pea shingle (dry site) over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). When using pea shingle continue to back fill up to required level. Temporarily strut the access shaft to avoid distortion.

2.4.4 Where we supply an extension shaft to meet a deeper invert requirement, a coalescer extension chain will be required. When fitting, ensure that the chain is secured to just below the surface so that the coalescer can easily be removed. Remove the coalescer from the unit before adding the extension chain. When refitting, ensure that the coalescer core tube is correctly seated onto the base fitting. This is important and you must ensure that the coalescer is correctly located before putting the unit in to operation.

2.4.5 It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant. Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. The original fixing hole bolting the coalescer to the neck should be sealed. If extending the neck, remember to add a suitable length of cord to enable the float valve to be lifted when the unit is emptied. If the valve is not raised during filling then the float valve may self seat.

2.4.6 The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.

2.4.7 Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck. When using pea shingle back fill as required.

2.4.8 Mains powered Alarm Systems. See alarm suppliers installation instructions. Lay 82mm diameter PVCu underground ducting between the alarm panel location and the alarm probe position. The ducting should be 500mm below ground level and fitted with a drawstring for later cable insertion. Any changes of direction should be by long radius bend. If necessary, drill a suitable hole in the access shaft adjacent to the alarm probe terminal box, to accept the ducting and seal.

2.4.9 In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

2.4.10 The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/ marked inside the neck for future information. The unit is now ready for use.

2.5 Alarm Installation

2.5.1 Install the alarm probe and control panel, as per the Suppliers Alarm Installation Guidelines. Ensure that the probe is positioned correctly for the required storage of oil. The table below indicates the maximum volume of oil to be stored and the depth of floating oil expected in the separation chamber.

Unit	Recommended Maximum Oil Storage volumes in litres	Actual Oil Storage volume in litres	Max. (100%)Depth of floating oil (Static)
NSFP003	30 litres	107	210mm
NSFP006	60 litres	107	210mm

3 Operation

3.1.1 The unit is sized on treating a defined area and rainfall (65 mm/hour) EN.858 Part 1 and using the factor provided in the Environment agency guidelines PPG3. (0.018 = 65mm/hr) The entire flow up to the units listed flow rating is fully treated.

3.1.2 An oil probe should be positioned to detect the accumulation of oil when there is no or low flow conditions. The probe should be positioned so that the alarm operates at 90% of the rated oil storage volume. **When the alarm operates, the oil should be removed. Accumulated silt should also be removed.**

3.1.3 Units include a core tube with replaceable media. Separated liquid enters the core tube after passing through the media, to the outlet. The coalescer media requires maintenance and replacement at intervals. (See Section 4).

3.1.4 Units are provided with a closure device, incorporating a float. As the level of oil builds up and forms a floating layer, so the float/closure device moves downward to prevent oily water being passed through the unit. The unit **MUST** be emptied after the closure device has operated. The coalescer media should be inspected and changed if fouled.

3.1.5 These separators are not effective for the removal of soluble or emulsified pollutants such as oil/detergent mixes found in vehicle wash effluents. With permission such discharges should be drained to the foul sewer. Consult our Technical Sales Department for suitable alternative equipment.

4 Maintenance

4.1 Waste Removal and Servicing

4.1.1 Separated light liquid **must** be removed from separator when the oil capacity has been reached.

4.1.2 An oil level alarm system is available for purchase which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.

4.1.3 Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any oil volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.

4.1.4 Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the construction programme itself generates large and perhaps unusual quantities of silt and grit. We do recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. The inspection and emptying programme can then be defined following the first 6 months site experience. We recommend leaving a maximum interval between inspections of 6 months.

4.1.5 Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced. If the unit is emptied, the float/closure device should be raised, and lowered only after the unit has been refilled. (Do not lower it in an empty unit, as the closure will self seat.)

4.1.6 **Separator waste is a "special waste" under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**

4.1.7 You should consider the purchase of a maintenance service, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer (where appropriate).

4.2 Waste Removal Procedure – Oil & Silt

4.2.1 **Oil can only be effectively removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn the oil can coat the media surface and when replaced the oil may be forced through the media, contaminating the effluent.**

4.2.2 Remove the access cover and lower the desludging hose in to the separation chamber. Draw off the surface oil.

4.2.3 If removing the silt, lower the desludge hose to the base of the tank and empty the contents of the chamber. Ensure that you access and clean all compartments.

4.2.4 Remove the alarm probe, if fitted, clean with water and replace. Ensure that it is working correctly.

4.2.5 Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced and secured into position. Replace the access covers. It is best to lower the water level to aid re-fitting.

4.2.6 Re-fill the separator with clean water up to the outlet level.

4.2.7 If an alarm is fitted, it will display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

4.3 Checking the Coalescer Assembly

4.3.1 Coalescers should be checked and cleaned regularly to maintain efficiency. Coalescers should be checked following a major incident and media replaced if necessary. It may be possible to squeeze/rinse out silt contamination from the media, but it is impossible to remove oil. Please contact us if you wish to purchase replacement coalescer media.

4.3.2 Identify the type and size of separator (shown on labels inside the access neck).

4.3.3 Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:

4.3.3.a In excess of the maximum assembly weight.

4.3.3.b The assembly completely out of the access shaft.

4.3.3.c Giving a smooth and controlled lift.

4.3.3.d Swinging the assembly to one side clear of the access shaft.

Unit	Dry Weight (Kg) Core tube & media	Wet Weight (Kg) Core tube & media	Silted Weight (Kg) Core tube & media	Replacement Media Part No.
NSFP003	11 kg	21 kg	≈30 kg	402672
NSFP006	11 kg	21 kg	≈30 kg	402672

4.3.4 Ensure that the area around the access shaft is clear and that there is space to place the assembly once removed. If space is not available it will be necessary to support the assembly over the access shaft. e.g. by scaffold poles and platform.

4.3.5 Only remove the access cover when necessary to remove the assembly. Do not leave the access shaft uncovered and unattended.

4.4 Removing the coalescer assembly.

4.4.1 Undo any fixings which secure the coalescer to the access shaft (if fitted).

4.4.2 Lift the assembly with a smooth and steady motion. Coalescers will become lighter as water drains from the exposed media. Allow the water to drain completely. Assemblies blocked with fine silt may be very heavy.

4.4.3 Fully extract the assembly and set it down adjacent to the access shaft.

4.5 Cleaning the coalescer assembly/ Media Replacement.

4.5.1 Hose down the assembly using clean water at normal pressure. If the media is heavily contaminated with oil and silt, it may not be possible to clean it effectively by hosing and should be replaced. Do not allow untreated cleaning water to pass out of the unit. Continue hosing until the water runs clear.

4.5.2 To replace the media, undo the banding. Slide media of the core tube and slide new media on. Ensure all the apertures on the core tube are covered by the media. Re-secure or replace banding. Consider replacing media and banding every two years.

4.6 Replacing the coalescer assembly.

4.6.1 Position coalescer assembly over the access shaft and remove any safety coverings.

4.6.2 Lower the assembly steadily into the access shaft, orientate the core tube correctly and locate over sump cone. Check that the float/closure device is free to operate.

4.6.3 Replace the access cover.

5 Connection of Extension Neck

(Option in 1800L Tanks only)

5.1.1 See the accompanying illustration.

5.1.2 Remove existing lid by unscrewing 8 screws and lifting off lid.

5.1.3 Apply mastic around flange of tank that joins to extension neck.

5.1.4 Place extension neck onto flange of the tank and screw down using 8 fixings.

5.1.5 Please refer to drawing NSFPEXTzz

5.1.6 Apply mastic to top face of extension piece that is joining to cover.

5.1.7 Place lid on top of extension neck and screw down using 8 fixings.

5.1.8 Backfill in 200mm stages with concrete (wet site) or peashingle (dry site), bracing neck during each stage until you reach the cover level.

5.1.9 For traffic area loading ensures you refer to tank installation section.

6 Emergencies

6.1.1 At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2012 **- 0800 80 70 60**

HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the Separator supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

OIL ALARM SYSTEMS

PPG3 requires that that the oil level alarm be fitted, tested and commissioned by a competent Installer. This is to ensure that the excessive oil probe is calibrated correctly, raising an alarm when 90% of the recommended maximum oil storage volume is reached. Should the oil level alarm fail to provide an early warning, excessive oil could pass through the separator, thus polluting the environment. This could result in substantial cleanup costs and legal action being taken under the water resources act 1991.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment. Operators who rely on oil level alarms to prompt them to service separators between maintenance intervals run the risk of polluting should the alarms not work, hence the ongoing functional assessment of the oil alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sediment and retained oil/grease should be carried out by a contractor holding the relevant permits to transport and dispose of such waste. The contractor must refer to the guidelines in this document.

SEPARATOR MAINTENANCE LOG

Site address/location .....

.....

Separator location .....

.....

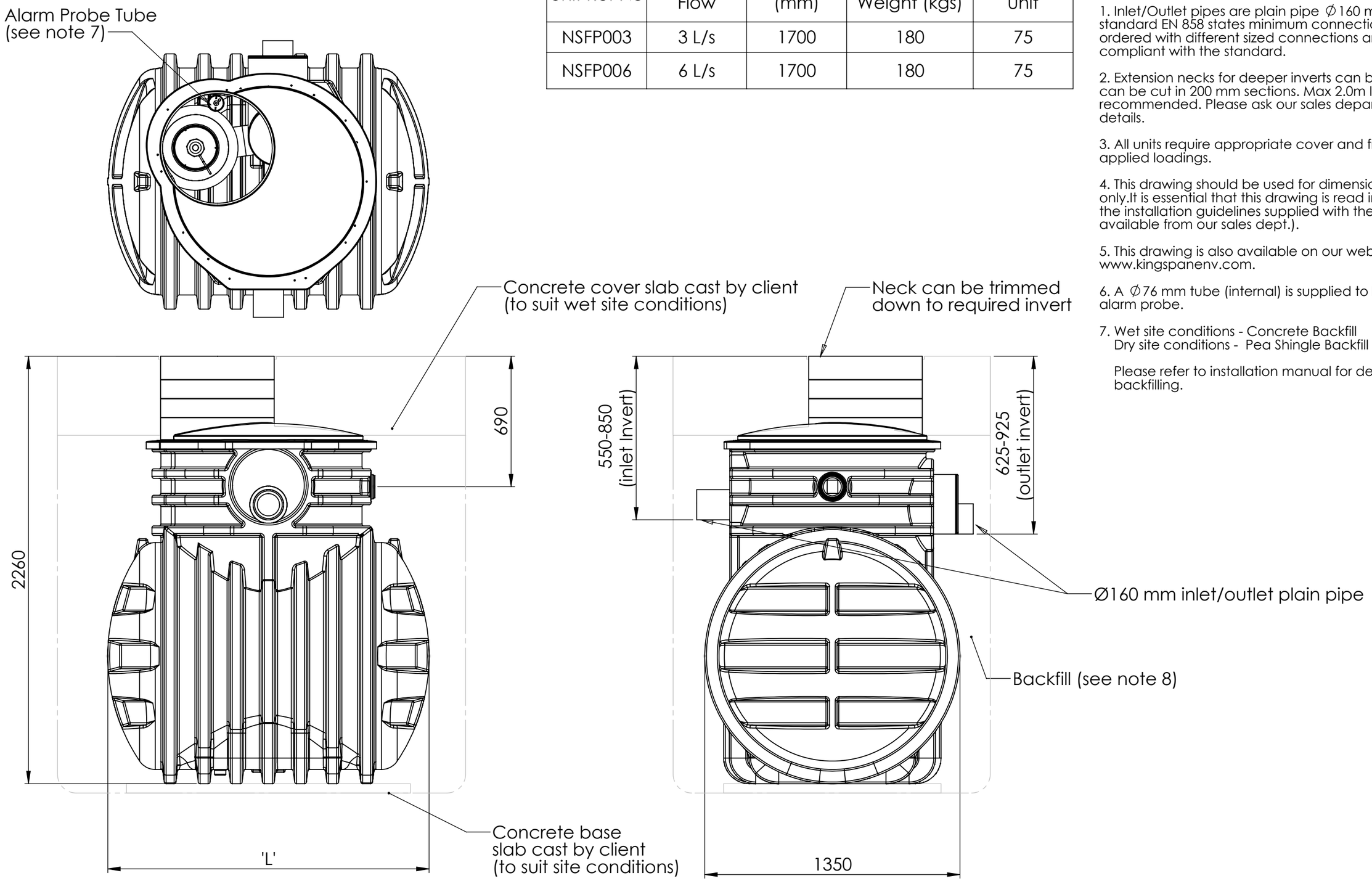
Type of separator .....

Nominal Flow .....

Total capacity .....

Inspection/ Maintenance Date	Comments	Waste Volumes Removed (if appropriate)

Unit Ref No	Nominal Flow	Dim L (mm)	Approx Empty Weight (kgs)	Fall across unit
NSFP003	3 L/s	1700	180	75
NSFP006	6 L/s	1700	180	75



Notes:-

1. Inlet/Outlet pipes are plain pipe ∅160 mm PVCu. The standard EN 858 states minimum connection sizes, units ordered with different sized connections are not fully compliant with the standard.

2. Extension necks for deeper inverts can be provided. These can be cut in 200 mm sections. Max 2.0m Invert recommended. Please ask our sales department for further details.

3. All units require appropriate cover and frame to suit applied loadings.

4. This drawing should be used for dimensional information only.It is essential that this drawing is read in conjunction with the installation guidelines supplied with the unit.(Copies are available from our sales dept.).

5. This drawing is also available on our website www.kingspanenv.com.

6. A ∅76 mm tube (internal) is supplied to house an oil alarm probe.

7. Wet site conditions - Concrete Backfill
   Dry site conditions - Pea Shingle Backfill

   Please refer to installation manual for details of correct backfilling.

Please check with Kingspan Environmental that this drawing is the latest issue				
Issue	Date	Drawn by	Approved by	Description
04	15/12/10	S.Gill		CC934
03	24/02/10	S. Gill		CC794
02	23/09/09	S.Gill		Drawing Description Changed/Table Corrected
01	19/03/09	S.Gill		Initial Release

All dimensions in mm

Scale: Not to scale

Y:\engineering\Drawing Data\02 - Sales Drawings\DS\DS - 09\DS0992 NSFP003-NSFP006 Full retention Seperators Sales Drawing

Material : n/a	Tolerance : n/a
Finish : n/a	Thickness : n/a
Weight : Kgs n/a	Surface Area : n/a

Drawing : NSFP 003-006 Sales Drawing

Drg No - DSO992

Kingspan Environmental

Section 8.2
Oil Level Alarms

017020	Mains Separator Alarm IP65 = Alarm + Oil Probe (5m)
017023	Mains Separator Alarm IP65 GSM = Alarm with GSM + Oil Probe
017025	Mains Separator Alarm IP65= Alarm + Oil Probe + Silt Probe + High Level Probe
017032	Mains Separator Alarm IP65 = Alarm + Silt Probe
017234	Mains Separator Alarm IP65 = Alarm + Oil Probe (25m)
017334	Mains Separator Alarm IP65= Alarm + Oil Probe + Silt Probe
017419	Mains Separator Alarm IP65= Alarm + Oil Probe + High Level Probe
017570	Mains Separator Alarm IP65= Alarm + Oil Probe + Beacon + Siren
017021	Solar Powered Separator Alarm = Alarm + Oil Probe + Distribution Box + Beacon + Stand
017360	Solar Powered Separator Alarm = Alarm + High Level Probe + Distribution Box + Beacon + Stand
017519	Solar Powered Separator Alarm = Alarm + Oil Probe + High Level Probe + Silt Probe + Distribution Box + Beacon + Stand
017022	Solar Powered Separator Alarm GSM = Alarm with GSM + Oil Probe + Distribution Box + Stand
017743	Solar Powered Separator Alarm GSM = Alarm with GSM + Oil Probe + High Level Probe + Silt Probe + Distribution Box + Sta
017954	Solar Powered Silt Alarm = Alarm + Silt Probe + Distribution Box + Beacon + Stand
017024	Battery Powered Separator Alarm GSM = Alarm with GSM + Oil Probe
017586	Battery Powered Separator Alarm = Alarm with GPRS/Web Interface IP65 Enclosure + Oil Probe + 4 x 1.5v Alkaline Batteries

ACCESSORIES

017217	High Level Probe Only (14011)
017236	Oil Probe Only (14000)
017237	Signal Distribution Box (14039)
017333	Flashing Beacon/Siren Kit (14100) (Mains Only)
017374	Flashing Beacon Kit (14012)
017499	Silt Probe Only (14220)
017671	Solar Alarm Battery Pack (GCT4)

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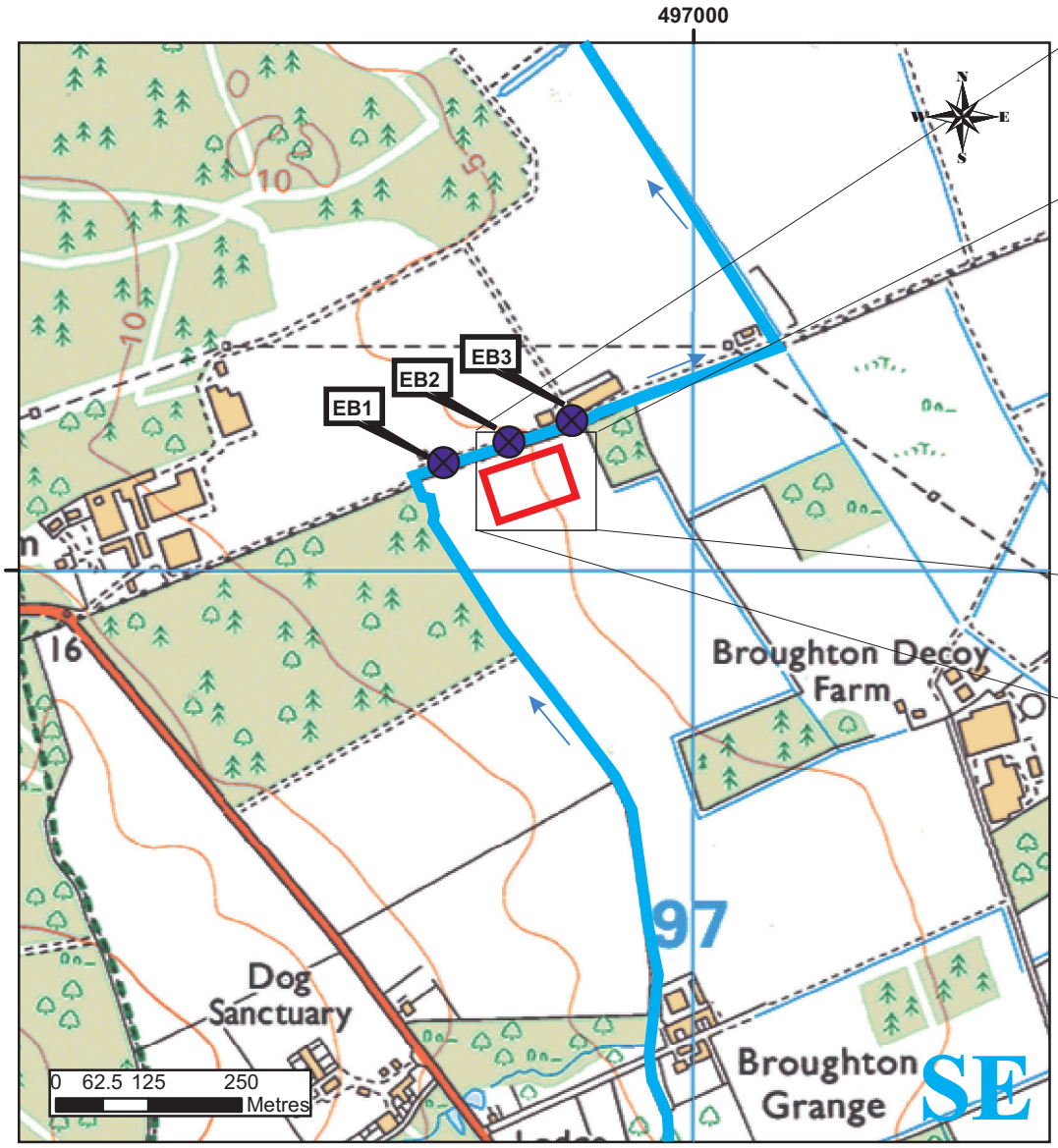
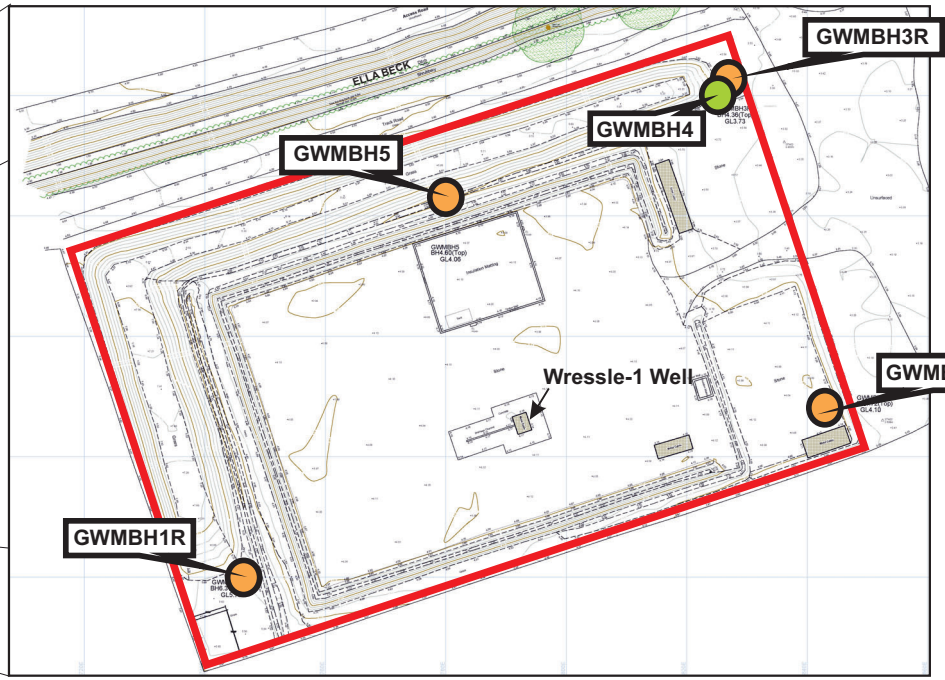
APPENDIX 3 - SITE LAYOUT PLAN AND MONITORING LOCATIONS





Scale 1:10,000 *at A4*

KEY

- Wellsite Boundary
- Monitoring Borehole (Unconsolidated Sands Aquifer)
- Monitoring Borehole (Lincolnshire Limestone)
- Surface Water Monitoring Location
- Surface Water Feature with flow direction

Monitoring Location National Grid References:

GWMBH1R:	496745, 411080
GWMBH2R:	496843, 411108
GWMBH3R:	496827, 411162
GWMBH4:	496826, 411160
GWMBH5:	496780, 411143
EB1:	496657, 411136
EB2:	496771, 411163
EB3:	496860, 411205

envireau WATER

Ref: P20-041/Egdon Wressle 2020/ FIG 1 Site and Mon Locations Date: 27/08/2020	**Egdon Resources: Wressle**
Figure 1	Site and Monitoring Locations

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APPENDIX 4 - DISCHARGE RISK ASSESSMENT

Wressle wellsite

Surface Water Management Plan Risk Matrix

	Probability			
Consequen	Very Low	Low	Medium	High
Very Low	Negligible	Negligible	Low	Medium
Low	Negligible	Low	Medium	Medium
Medium	Low	Medium	Medium	High
High	Medium	Medium	High	High

ID	Potential Release Point	Activity / Event Leading to Emission	S-P-R Linkage			Exposure Probability	Consequence	Risk Magnitude	Risk Management	Residual Risk
			Source	Pathway	Receptor					
Normal Operations (Production and Site Suspension)										
01	Site Production Equipment. • Wellhead • Pumpjack • Separator • Knock Out Pot • Bath Heater	Equipment Failure	Produced Wellbore Fluids • Oil • Formation Water	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Plant and Equipment Installed to Relevant Standards Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Equipment Pressure Tested Prior to Installation Automatic ESD Devices installed on production equipment in the event of High Pressure / Low Pressure, preventing / limiting wellbore fluid spillages. Site remotely monitored via CCTV system when unmanned. Competent Operators employed / contracted. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Automated alerts / notifications to the Operator in real time when site is unmanned, allowing sufficient time to attend site and contain the site where necessary. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
02	Site Production Equipment. • Wellhead • Pumpjack • Separator • Knock Out Pot • Bath Heater	Planned Breaking of Containment	Produced Wellbore Fluids • Oil • Formation Water	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Competent Operators employed / contracted. Plan for breaking containment at cessation of operations. (Where Possible) Purge equipment prior to breaking containment. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Interceptor to be locked off temporarily for short term containment break and locked on provided no spillage occurs. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
03	Storage Vessels • Oil • Formation Water • Rainwater (Bund)	Overfilling of Storage Vessels	Produced Wellbore Fluids • Oil • Formation Water • Rainwater	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Plant and Equipment Installed to Relevant Standards. A concrete bund will house all storage tanks. Automatic ESD Devices installed on production equipment in the event of High Pressure / Low Pressure, preventing / limiting wellbore fluid spillages. Site remotely monitored via CCTV system when unmanned. Competent Operators employed / contracted. Personnel inducted / trained on Emergency Response Procedures. Automated alerts / notifications to the Operator in real time when site is unmanned, allowing sufficient time to attend site and contain the site where necessary. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible

ID	Potential Release Point	Activity / Event Leading to Emission	S-P-R Linkage			Exposure Probability	Consequence	Risk Magnitude	Risk Management	Residual Risk
			Source	Pathway	Receptor					
04	Storage Vessels • Oil • Formation Water • Rainwater (Bund)	Equipment Failure	Produced Wellbore Fluids • Oil • Formation Water • Rainwater	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Plant and Equipment Installed to Relevant Standards. A concrete bund houses all storage tanks in accordance with CIRIA 736. Equipment Pressure Tested Prior to Installation. High level alarm within the storage bund activates a pump, collected liquids are pumped to a dedicated tank located within the bund. Site remotely monitored via CCTV system when unmanned. Competent Operators employed / contracted. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Automated alerts / notifications to the Operator in real time when site is unmanned, allowing sufficient time to attend site and contain the site where necessary. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service/Maintenance regime implemented	Negligible
05	Storage Vessels • Oil • Formation Water • Rainwater (Bund)	Planned Breaking of Containment	Produced Wellbore Fluids • Oil • Formation Water • Rainwater	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Competent Operators employed / contracted. Plan for breaking containment at cessation of operations. (Where Possible) Purge equipment prior to breaking containment. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Interceptor to be locked off temporarily for short term containment break and locked on provided no spillage occurs. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
06	Road tanker used for the transfer of Crude Oil / Produced Water offsite	Transfer of Crude Oil / Produced Water to road tanker haulage vehicle	Produced Wellbore Fluids • Oil • Formation Water • Rainwater	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Tanks and associated pipework protected. Use of secondary containment systems / bunds. Transfer operations monitored by site personnel. Tanks sealed after transfer. Competent Operators employed / contracted. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Interceptor to be locked off temporarily for short term containment break and locked on provided no spillage occurs. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
07	Road tanker used for the transfer of Crude Oil / Produced Water offsite	Equipment Failure	Produced Wellbore Fluids • Oil • Formation Water • Rainwater	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Equipment serviced / maintained as required by relevant standards. Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Transfer operations monitored by site personnel. Competent Operators employed / contracted. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible

ID	Potential Release Point	Activity / Event Leading to Emission	S-P-R Linkage			Exposure Probability	Consequence	Risk Magnitude	Risk Management	Residual Risk
			Source	Pathway	Receptor					
08	Fuel storage tank for site power generation	Containment / Storage of / use of Gas Oil	Gas Oil	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Equipment serviced / maintained as required by relevant standards. Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Transfer operations monitored by site personnel. Competent Operators employed / contracted. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
09	Fuel storage tank for site power generation	Planned Breaking of Containment	Gas Oil	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Competent Operators employed / contracted. Plan for breaking containment at cessation of operations. (Where Possible) Purge equipment prior to breaking containment. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Interceptor to be locked off temporarily for short term containment break Full Retention Class 1 Separator installed with Automatic Closure Device Full Retention Separator Service / Maintenance regime implemented and	Negligible
10	Fuel storage tank for site power generation	Equipment failure	Gas Oil	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Equipment serviced / maintained as required by relevant standards. Connections shall be subject of secondary containment measures such as bunds or similar (not site HDPE Liner). Transfer operations monitored by site personnel. Competent Operators employed / contracted. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
11	Road tanker used for the transfer Gas Oil to site.	Transfer of Gas Oil from road tanker haulage vehicle	Gas Oil	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Tanks and associated pipework protected. Use of secondary containment systems / bunds. Transfer operations monitored by site personnel. Tanks sealed after transfer. Competent Operators employed / contracted. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible
12	Storage / Process Areas	Storage / use of hazardous products	New / used hazardous chemicals	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Utilise non-hazardous substances where possible. Use of secondary containment systems / bunds. Decanting of chemicals conducted within secondary containment system. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Regular inspection of connections and pipes for failure or leaks. Full Retention Class 1 Separator installed with Automatic Closure Device (ACD), removing any trace oils prior to discharge. Full Retention Separator Service / Maintenance regime implemented and adhered to.	Negligible

ID	Potential Release Point	Activity / Event Leading to Emission	S-P-R Linkage			Exposure Probability	Consequence	Risk Magnitude	Risk Management	Residual Risk
			Source	Pathway	Receptor					
13	Storage / Process Areas	Container failure	New / used hazardous chemicals	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Utilise non-hazardous substances where possible. Use of secondary containment systems / bunds. Decanting of chemicals conducted within secondary containment system. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Regular inspection of connections and pipes for failure or leaks. Interceptor to be locked off temporarily for short term containment break	Negligible
14	Storage / Process Areas	Reaction between materials. Degradation of Materials	New / used hazardous chemicals	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Utilise non-hazardous substances where possible. Use of secondary containment systems / bunds. Segregation of incompatible chemicals. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Regular inspection of connections and pipes for failure or leaks. Interceptor to be locked off temporarily for short term containment break Stock inventory to be kept to a workable minimum.	Negligible
15	Site sewage tank	Planned breaking of containment	Sewage and waste water	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	Medium	Medium	Use of secondary containment systems / bunds. Competent Operators employed / contracted. Plan for breaking containment at cessation of operations. (Where Possible) Purge equipment prior to breaking containment. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures.	Negligible
16	Site sewage tank	Equipment Failure	Sewage and waste water	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	Medium	Medium	Use of secondary containment systems / bunds. Competent Operators employed / contracted. Plan for breaking containment at cessation of operations. (Where Possible) Purge equipment prior to breaking containment. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Interceptor to be locked off temporarily for short term containment break	Negligible
17	Site sewage tank	Transfer of sewage and waste water to road tanker haulage vehicle	Sewage and waste water	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	Medium	Medium	Tanks and associated pipework protected. Use of secondary containment systems / bunds. Transfer operations monitored by site personnel. Tanks sealed after transfer. Competent Operators employed / contracted. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular inspection of connections and pipes for failure or leaks.	Negligible

ID	Potential Release Point	Activity / Event Leading to Emission	S-P-R Linkage			Exposure Probability	Consequence	Risk Magnitude	Risk Management	Residual Risk
			Source	Pathway	Receptor					
18	Skips and receptacles used for waste storage	Storage of general site waste prior to offsite disposal	General waste including food	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	Medium	Medium	Dedicated waste receptacles present at site for general waste. High level of housekeeping demanded by the Operator for all its sites. Audits to be undertaken by the Operator on the Wellsite Supervisor and the Wellsite.	Negligible
19	Skips and receptacles used for waste storage	Equipment failure	General waste including food	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	Medium	Medium	Dedicated waste receptacles present at site for general waste. High level of housekeeping demanded by the Operator for all its sites. Audits to be undertaken by the Operator on the Wellsite Supervisor and the Regular inspection of waste containers for failure or leaks.	Negligible
20	All Site Equipment	Human Error / Human Behavioural	Produced Wellbore Fluids • Oil • Formation Water	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Low	High	Medium	Established and Tested Well Control Procedures. Wellsite Supervisor to hold the necessary qualification and experience to Audits to be undertaken by the Operator on the Wellsite Supervisor and the Established Management System providing direction on the support and	Negligible
Nonstandard Operations										
21	Various across site	Nonstandard Operations including: • Workovers; • Well Treatments • Proppant Squeeze • Hot Washing • Drilling	Additional chemicals and materials where storage arrangements are temporary only.	Discharge of Surface Water (Rainwater) collected from the 'Active Area' site foot print. Ella Beck and Downstream Confluence	• RAMSAR • SAC (inc. Marine) • SPA (inc. Marine) • SSSI • LNR • SAM • Sensitive Receptors • Surface Water Features • Surrounding Environment	Medium	High	High	Established and Tested Well Control Procedures. Plant and Equipment Installed to Relevant Standards Connections shall be subject of secondary containment measures such as Equipment Pressure Tested Prior to Installation Competent Operators employed / contracted. Regular inspection of connections and pipes for failure or leaks. Personnel inducted / trained on Emergency Response Procedures. Full Retention Class 1 Separator installed but Locked Closed prior to the commencement of Non-Routine Operations.. Full Retention Class 1 Separator can only be opened once ditch water sampling and analysis has been undertaken and confirmed by the Environment Agency as being suitable for discharge.	Negligible

Designation	Search Radius	Name	Distance from Site	Direction from Site	NGR
RAMSAR	10km	Humber Estuary	10km	North	SE 96425 21193
Special Areas of Conservation (SAC)	10km				
Special Protection Areas (SPA)	10km				
Sites of Special Scientific Interest (SSSI)	2km	Broughton Far Wood	0.58 Km	West	SE 96162 10928
		Broughton Alder Wood	1.30 Km	Southwest	SE 96119 10008
Special Protection Areas (Marine)	2km	N/A			
Special Areas of Conservation (Marine)	2km	N/A			
Marine Conservation Zones	2km	N/A			
World Heritage Sites	2km	N/A			
National Nature Reserves	2km	N/A			
Local Nature Reserves	2km	N/A			
National Forest	2km	N/A			
RSPB Reserves	2km	N/A			
Registered Battlefields	2km	N/A			
Areas of Outstanding Natural Beauty (AONB)	2km	N/A			
Scheduled Monuments	2km	Thorneholme Augustinian Priory	1.18 Km	North	SE 96677 12346
			1.19 Km	North	SE 96491 12315
Wood Pastures and Parkland BAP Priority Habitat	2km	N/A			
National Parks	2km	N/A			
Surface Water Features	2km	Ella Beck "Main River".	0.01km	North	SE 96780 11165
		Dyke East of Site First drain down	0.58km	East	SE 96909 11118
		Small Pond east of Rowland	0.59km	North	SE 96744 11634
		Small Pond at The Lodge. Water on	0.87km	South	SE 96715 10292
		Large Pond	0.97km	North	SE 96930 12041
		Small Ponds at Common Farm	1.00km	Southeast	SE 97492 10465
		Small Pond at Kebwood Farm	1.04km	West	SE 96391 12071
		Small Pond south of Broughton	1.10km	South	SE 97056 10100
		Small Pond 1 at Far Wood Farm	1.28km	Southwest	SE 96239 10029
		Small Pond 2 at Far Wood Farm	1.28km	Southwest	SE 96256 09995
		Large Pond at near Birdhouse	1.32km	Northeast	SE 98006 11560
		Small Fish Pond 1 at the Priory	1.32km	North	SE 96640 12362
		Small Fish Pond 2 at the Priory	1.34km	North	SE 96581 12382
		Small Fish Pond 3 at the Priory	1.42km	North	SE 96728 12376
		Small Pond 3 at Far Wood Farm	1.46km	Southwest	SE 96154 10003
		Spring 1 near Far Wood Farm	1.47km	Southwest	SE 95923 09966
		Planker Dike	1.49km	East	SE 98317 11322
		Spring 2 near Far Wood Farm	1.53km	Southwest	SE 95818 09983
		Appleby Old River Ancholme	1.57km	East	SE 98282 11732
		New River Ancholme	1.58km	East	SE 98332 11269
		Small Pond SW of Appleby Carrs	1.76km	Northeast	SE 97701 12530
		Small Pond at Wressle Wood	1.80km	Southeast	SE 97797 09692
		Small Pond at Broom Hill	1.84km	West	SE 95015 11496
		Small Pond at Watermill Place fed	1.90km	South	SE 97035 09324
		Large Pond at The Follies	1.91km	North	SE 96562 12912
		Moor Beck Running eastward and	1.91km	South	SE 97290 09531
		Small Pond at Appleby Carrs	2.00km	Northeast	SE 97891 12751
		Spring at Westwood Lodge	2.00km	Southwest	SE 95467 09644
Source Protection Zones	2km	No data available	0.07 Km	East	SE 96899 11183
		No data available	0.27 Km	East	SE 97075 11287
		No data available	1.14 Km	Southeast	SE 97646 10277
		No data available	1.34 Km	Southeast	SE 97776 10124
		No data available	1.76 Km	Southeast	SE 97979 09745
Drinking Water Safeguard Zones (Surface Water)	2km	N/A			
Drinking Water Safeguard Zones (Groundwater)	2km	N/A			
Bathing Waters	2km	N/A			
Drinking Water Protected Areas (Surface Water)	2km	N/A			

Designation	Search Radius	Name	Distance from Site	Direction from Site	NGR
Sensitive Receptors: Households / Businesses	2km	Lodge Farm	0.37km	West	SE 96337 11012
		Decoy Cottage	0.52km	Southeast	SE 97275 10822
		Broughton Decoy Farm	0.56km	Southeast	SE 97377 10856
		Broughton Grange Cottages & Dog	0.60km	Southwest	SE 96617 10413
		Broughton Grange	0.67km	South	SE 96976 10444
		Common Farm	0.98km	Southeast	SE 97528 10400
		Kebwood Farm	0.98km	North	SE 96266 12025
		Far Wood Farm	1.12km	Southwest	SE 96143 10088
		Sandbeck	1.14km	Southeast	SE 97547 10207
		Dairy Farm	1.31km	Southeast	SE 97430 09962
		Wressle	1.39km	South	SE 97278 09789
		Heron Lodge	1.55km	West	SE 95211 10690
		Broughton	1.58km	South	SE 96234 09566
		Springwood Lodge & Cottage	1.64km	West	SE 95080 11065
		Bridge Farm	1.72km	East	SE 98465 10637
		Sandhouse Farm	1.77km	Northwest	SE 95751 12604
		Gokewell Priory Farm (Poultry Farm)	2.00km	Southwest	SE 95016 10056

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