

Technical Note 1: Water Neutrality Statement

Site: The Grain Barn, Woodhouse Farm
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Date: 28 April 2023

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1.0 Introduction

- 1.1 This Water Neutrality Statement (WNS) has been prepared on behalf of Woodhouse Farm to demonstrate how the proposed development will achieve water neutrality.
- 1.2 Following the issue of Natural England's (NE's) Position Statement on Water Neutrality within the Sussex North Water Supply Zone (SNWSZ) it is understood that Horsham District Council (HDC) require all new and reserved matter planning applications to demonstrate that the development can be water neutral and/or that it does not result in a significant effect. NE's Position Statement can be found in full within **Appendix A**.
- 1.3 The SNWSZ covers most of the Horsham District, as well as parts of the neighbouring Chichester, Arun and Crawley Districts. A plan showing the supply area can be found in **Appendix B**.
- 1.4 This statement sets out the following:
 - ▶ Baseline calculations for the existing development;
 - ▶ The anticipated additional water demand as a result of the proposed development;
 - ▶ Water reduction measures that can be incorporated into the development, such as water efficient fixtures and fittings and rainwater harvesting; and
 - ▶ The proposed measures to offset any remaining deficit following the above.

2.0 Background

- 2.1 The proposed development is located to the south of Wheatsheaf (B2116) on Woodhouse Farm, to the east of Henfield.
- 2.2 The site is an existing barn, which consists of a grain store, machine repair shop and farm office.
- 2.3 The proposals are for the conversion of the existing barn to create four three-bedroom houses. A copy of the proposed site layout can be found in **Appendix C**.

3.0 Baseline Calculations

- 3.1 The existing barn is currently used as a grain store, machine repair shop and office. The barn has an existing water supply providing water for washing down farm machinery and for crop spraying. Although the building will be converted to provide four new houses, the existing building and, therefore, water use will be accommodated within other buildings onsite. Therefore, because the existing water use is to continue on site after the development has taken place, no baseline data will be taken forward in the water neutrality calculations.

4.0 Onsite Proposals

Additional Demand

- 4.1 Part G of the current Building Regulations recommends that all developments achieve a water consumption of 125 litres per person per day.
- 4.2 The average occupancy level for a three-bedroom dwelling is 2.47, which is based on local census data (agreed by Horsham District Council).

- 4.3 Using the above census data, the population of the proposed development of four three-bedroom houses is calculated to be 9.88 persons.
- 4.4 Using the Building Regulations water consumption figure of 125 litres per person per day and a population size of 9.88 it is estimated that the total water usage per day for the proposed development would be 1,235 litres per day.

Water Reduction Measures

- 4.5 To minimise the water use of the development, water efficient fixtures and fittings will be incorporated to reduce water use to below the optional Building Regulations Part G Water Efficient requirement of 110 litres per person per day. All fixtures and fittings will meet the maximum consumption values set out in Table 2.2 of Building Regulation Part G.
- 4.6 A water calculation in accordance with Building Regulations Part G has been carried out and confirms that the proposed development will achieve a water consumption of 106.31 litres per person per day, which includes an allowance of 5 litres per person per day for external water usage. A copy of the Part G calculation can be found in **Appendix D**.
- 4.7 Using the Part G water consumption figure of 106.31 litres per person per day and a population size of 9.88 it is estimated that the total water usage per day for the proposed development would be reduced to 1,050.34 litres per day.
- 4.8 To help mitigate the increase in water demand it is proposed to incorporate rainwater harvesting into the proposed development. A rainwater harvesting tank will be included on each house.
- 4.9 The water collected by the rainwater harvesting units will be utilised for flushing toilets and in washing machines, and all other uses will be mains water fed.
- 4.10 The following table sets out proposed water use per person per day, as detailed in the Part G calculation and shows the split between the mains water usage and water supplied by rainwater water harvesting systems:

Fitting Type	Total Water Usage (l/p/day)	Mains Water Usage (l/p/day)	RWH System Usage (l/p/day)
WC (full flush)	5.84		5.84
WC (part flush)	7.70		7.70
Taps (Excluding Kitchen)	9.48	9.48	
Bath	18.70	18.70	
Shower	34.96	34.96	
Kitchen Taps	13.00	13.00	
Washing Machine	17.16		17.16
Dishwasher	4.50	4.50	
Total	111.33	80.64	30.70
Normalisation Factor	0.91	0.91	0.91
Total	101.31	73.38	27.94
External Water Use	5		5
Total	106.31	73.38	32.93

Table 4.1 – Water Usage

- 4.11 The above table confirms that 32.93 litres per person per day will be supplied by the rainwater harvesting systems, which equates to 325.35 litres per day across the proposed development.

- 4.12 The tanks for each of the plots have been sized using the calculations set out in BS 8515 and allow for 35 days of storage. The calculations also confirm that in all cases the yield is sufficient to meet the demand. The calculations are summarised in Table 4.2, below, and can be found in full in [Appendix E](#).

Unit	Number of Persons	Roof Area	5% Annual Rainwater Yield (litres)	5% Annual Water Demand (litres)	Tank Sizes (litres)
Dwelling 1	2.47	109	6,374	2,850	3,200
Dwelling 2	2.47	109	6,374	2,850	3,200
Dwelling 3	2.47	109	6,374	2,850	3,200
Dwelling 4	2.47	109	6,374	2,850	3,200
Totals			25,496	11,400	12,800

Table 4.2 – Rainwater Harvesting Sizing Calculations

- 4.13 A typical layout and specification for the rainwater harvesting system is shown in [Appendix F](#). The illustration shows how the rainwater will be collected, filtered and then returned to the property for re-use.
- 4.14 Once rainwater harvesting has been incorporated into the development proposals there will be a deficit of 725.02 litres per day, which will require further offsetting to ensure that the proposed development is water neutral. The proposed offsetting for the development is discussed further in Section 5 of this report, below.

5.0 Offsetting Measures

- 5.1 To ensure the development can demonstrate water neutrality, in accordance with the NE Position Statement, 725.02 litres per day will need to be offset.
- 5.2 The NE Position Statement states that offsetting can be carried out by retrofitting existing properties with grey water recycling systems, rainwater harvesting and/or water reduction fittings.
- 5.3 It is proposed to offset the development's water demand against the water use on the wider farm by incorporating a rainwater harvesting system on one of the existing barns.

Existing Demand

- 5.4 As discussed in Section 3 the barn's existing uses (a grain store, machine repair shop and office) will be relocated to elsewhere on the farm and, therefore, the farm's mains water use will remain the same.
- 5.5 The farm currently uses mains water to supply three private dwellings, the washing down of vehicles, crop spraying and drinking water for livestock.
- 5.6 To assess the existing water use of the farm the meter readings have been reviewed. There are currently four water meters on site. The first meter measures water use for the whole farm including the three private properties. The other three meters measure water use at each of the private properties. Therefore, to isolate the water use of the farm, the meter readings from the three properties should be subtracted from the main site meter reading, as this meter measures all water coming into the farm, including that used by the three properties.
- 5.7 Table 5.1 below provides a summary of each of the meter readings and the full analysis can be found in [Appendix G](#).

Meter	No. of Days	Water Use (m ³)	Water Use (litres)	Average Water Use (litres per day)
Main Farm	1,077	3,555	3,555,000	3,301
The Granary	1,847	467	467,000	253
The Barns	1,340	775	775,000	578
Deers Leap	1,306	721	721,000	552

Table 5.1 – Farm Water Use Summary

- 5.8 Photos of the meter readings are provided in **Appendix H**.
- 5.9 When the average water use of the three private properties is subtracted from the main farm meter reading, the remaining farm water use is 1,918 litres per day.

Water Reduction Measures

- 5.10 A rainwater harvesting system will be installed on one of the existing barns to the northeast of the proposed site, as shown on the plan in **Appendix I**.
- 5.11 The water captured in the rainwater harvesting system will be used on the farm for non-potable uses, such as crop spraying, vehicles washing down and drinking water for livestock.
- 5.12 The barn's roof area measures 36.5 metres by 12.2 metres, providing a total roof area of 445m².
- 5.13 The rainwater harvesting system has been sized using the calculations set out in BS 8515, which can be found in **Appendix J**, and are summarised, below, in Table 5.2.

Roof Area (m ²)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Average Daily Yield (litres)	Daily Demand (litres)	Tank Size (litres)
445	26,022	67,192	742	1,918	26,500

Table 5.2 – Rainwater Harvesting Sizing Calculations

- 5.14 The proposed rainwater harvesting system for the farm will incorporate a 26,500-litre tank, which will provide the necessary storage to provide at least 35 days water supply, which covers drought protection as required by HDC.
- 5.15 The average daily water yield from the barn's roof (742 litres) and the storage tank will be large enough to offset the deficit associated with the proposed development (725.02 litres as detailed in Paragraph 4.14). The remaining demand for the farm will continue to be met by the existing mains water supply to the farm.
- 5.16 Therefore, this demonstrates that the proposed offsetting scheme can deliver the necessary reduction in water use at the farm to offset the water use from the proposed development and demonstrates that the development will be water neutral.

6.0 Summary and Conclusions

- 6.1 This Technical Note sets out the water usage strategy for the proposed residential development at Woodhouse Farm.
- 6.2 The proposal is to incorporate on-site water efficient fixtures and fittings, as well as a rainwater harvesting system to the proposed development scheme.

- 6.3 Following the incorporation of the on-site measures identified above, the remaining increase in water demand will be offset against the proposed offsetting scheme on the wider farm.
- 6.4 This water neutrality strategy will minimise the impact of the new development on the Sussex North Water Supply Zone. The Water Usage Strategy confirms proposal will be water neutral once complete and, therefore, satisfying Natural England's requirements.

Appendix A

Natural England's Position Statement



Natural England's Position Statement for Applications within the Sussex North Water Supply Zone

September 2021 – Interim Approach

Please take the following as Natural England's substantive advice for all applications which fall within Sussex North's Water Supply Zone.

Sussex North Water Supply Zone

Arun Valley SPA, SAC and Ramsar Site- Sussex North Water Supply Zone

The Sussex North Water Supply Zone includes supplies from a groundwater abstraction which cannot, with certainty, conclude no adverse effect on the integrity of;

- Arun Valley Special Area Conservation (SAC)
- Arun Valley Special Protection Area (SPA)
- Arun Valley Ramsar Site.

As it cannot be concluded that the existing abstraction within Sussex North Water Supply Zone is not having an impact on the Arun Valley site, we advise that developments within this zone must not add to this impact. This is required by recent caselaw, [Case C-323/17 People over wind and Sweetman. Ruling of CJEU](#) (often referred to as sweetman II) and Coöperatie Mobilisatie for the Environment and Vereniging Leefmilieu Case C-293/17 (often referred to as the Dutch Nitrogen cases).

Between them these cases require Plans and Projects affecting sites where an existing adverse effect is known (i.e. the site is failing its conservation objectives), to demonstrate certainty that they will not contribute further to the existing adverse effect or go through to the latter stages of the Regulations (no alternatives IROPI etc).

Developments within Sussex North must therefore must not add to this impact and one way of achieving this is to demonstrate water neutrality.

In addition, the Gatwick Sub regional Water Cycle Study concluded that water neutrality is required for Sussex North to enable sufficient water to be available to the region.

The definition of water neutrality is the use of water in the supply area before the development is the same or lower after the development is in place.

Strategic approach

Natural England has advised that this matter should be resolved in partnership through Local Plans across the affected authorities, where policy and assessment can be agreed and secured to ensure water use is offset for all new developments within Sussex North. To achieve this Natural England is working in partnership with all the relevant authorities to secure water neutrality collectively through a water neutrality strategy.

Whilst the strategy is evolving, Natural England advises that decisions on planning applications should await its completion. However, if there are applications which a planning authority deems critical to proceed in the absence of the strategy, then Natural England advises that any application needs to demonstrate water neutrality. We have provided the following agreed interim approach for demonstrating water neutrality;

Minimising water use of new builds.

- Complete a water budget (based on occupancy)
- All new builds to demonstrate that they can achieve strict water targets (e.g., 85L/pp/day*)

This can be achieved by measures such as:

- Grey water recycling (advantage of being reliable in hot dry weather);
- Rainwater harvesting;
- Water efficient fixings (such as shower aerators) to demonstrably reduce demand-this would need to be suitably certain.

In addition, water offsetting is required

- One way to achieve this is retrofitting of council owned properties/commercial buildings-located within Sussex North. Examples include:
 - Grey water recycling- (for example there are clear opportunities for commercial properties).
 - Rainwater harvesting of commercial settings;
 - Installation of water reduction fittings in Council-owned buildings.

These measures need to be implemented until such time as a more sustainable water supply has been secured.

It will also need to be ensured that measures are not already proposed (for example in Southern Water's Management Plan) to avoid double-counting.

Any mitigation must be suitably certain in order to comply with the Habitats Regulations and Caselaw.

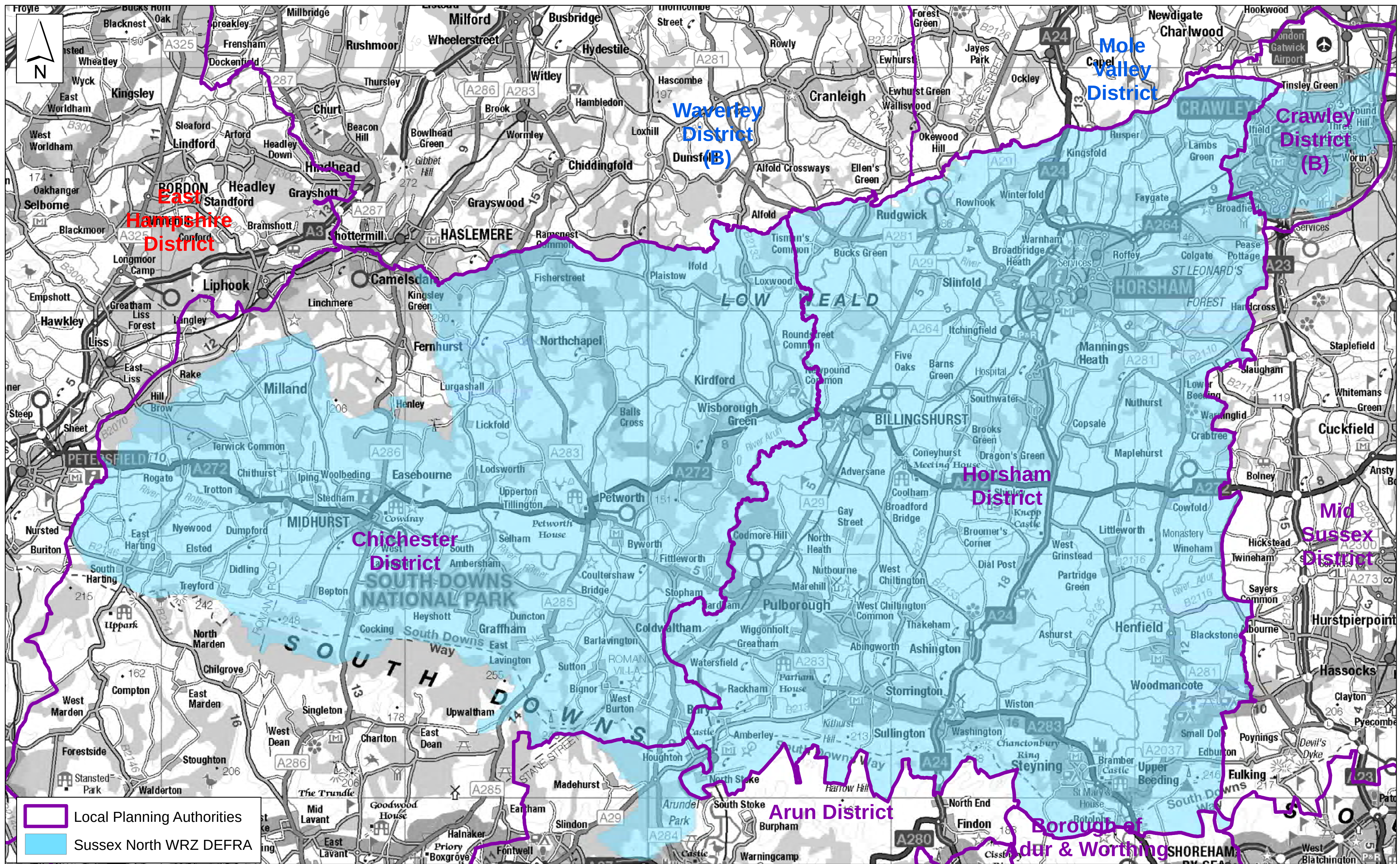
If the application cannot demonstrate, through an appropriate assessment, the required water neutrality, we advise that it is either revised to achieve this in line with the above or awaits completion of the strategic approach.

The securing of water neutrality is a matter which needs to be resolved at a strategic level and Natural England is working with the relevant authorities and the water company to achieve this. In light of this, Natural England will not be engaging with individual planning applications whilst the strategy is evolving.

***This this is the reasonably achievable figure with the above measures based on the early data from the strategic solution and may be subject to change as the strategic solution evolves.**

Appendix B

Sussex North Water Supply Zone



Horsham District Council

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Sussex North Water Resource Zone

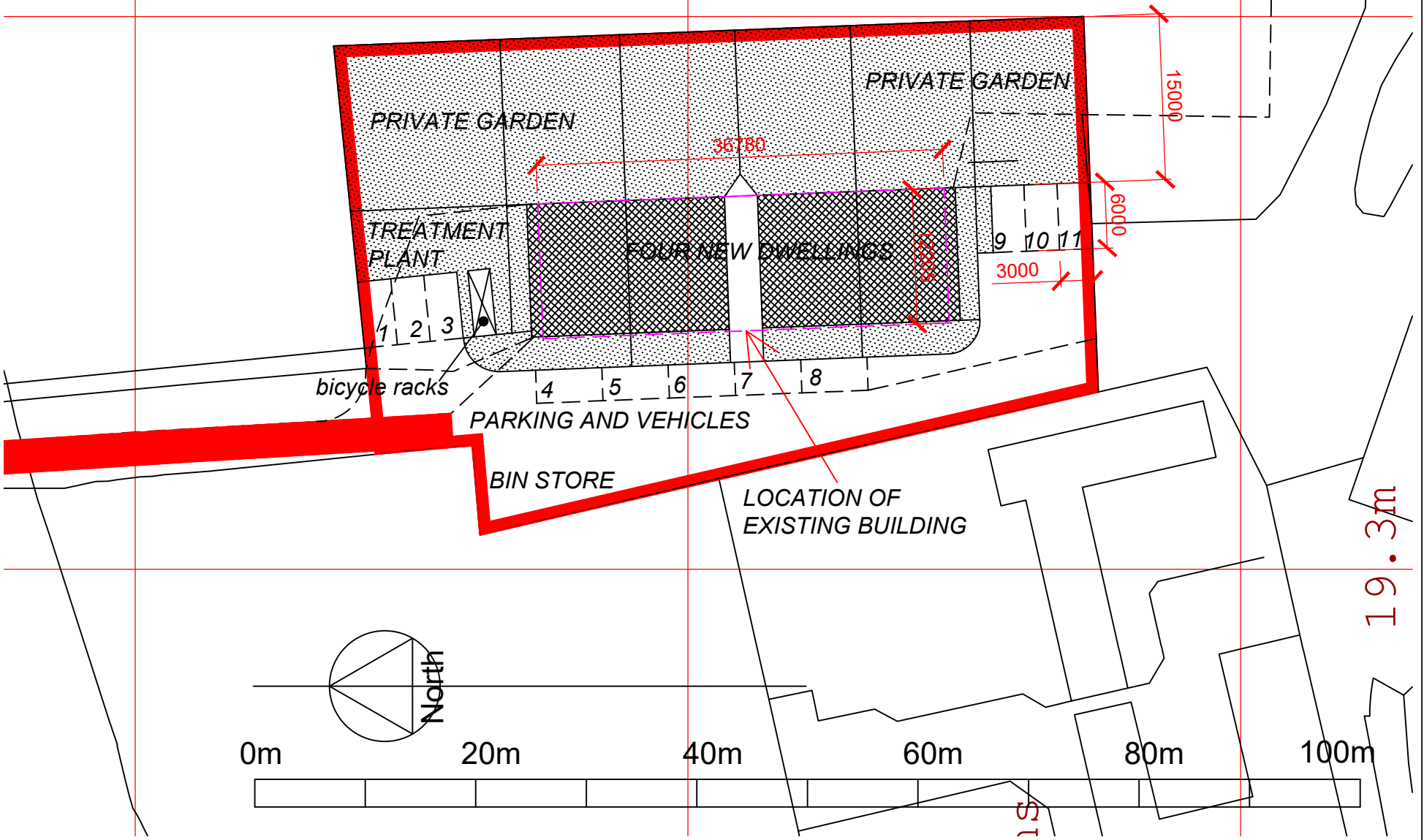
Chichester Horsham Crawley

Reference No :		Date : 23 November 2021	Scale : 1:3,000 at A2
Drawing No:	Drawn :	Checked :	Revisions :

Appendix C

Site Layout

A4 format



447pe15

rev B: 26.09.2021

Appendix D

Part G Calculation

Proposed Water Usage

Fixture	Capacity/Flow Rate	Use Factor	Fixed Use	litres/person/day
WC (Single Flush)		4.42		0.00
WC (Dual Flush)	4	1.46		5.84
WC (Dual Flush) Part	2.6	2.96		7.70
Taps (excluding kitchen)	5	1.58	1.58	9.48
Bath (where shower present)	170	0.11		18.70
Shower (where bath present)	8	4.37		34.96
Bath Only		0.5		0.00
Shower Only		5.6		0.00
Kitchen Sink	6	0.44	10.36	13.00
Washing Machine	8.17	2.1		17.16
Dishwasher	1.25	3.6		4.50
Total calculated use (litres/person/day)				111.33
Normalisation Factor				0.91
Total Water Consumption (CSH) (litres/person/day)				101.31
External Water Use				5.00
Total Water Consumption (Part G) (litres/person/day)				106.31

Rainwater Harvesting	32.93	litres/person/day
Mains Water	73.38	litres/person/day
Total	106.31	litres/person/day

	Population	Mains Water Usage	Rainwater Use
Proposed 3-bed house	2.47	181.25	81.34
Proposed 3-bed house	2.47	181.25	81.34
Proposed 3-bed house	2.47	181.25	81.34
Proposed 3-bed house	2.47	181.25	81.34
Totals	9.88	725.02	325.35

Appendix E

Residential Rainwater Harvesting Calculation

Rainwater Harvesting System (BS8515 - Intermediate Approach)

AAR	752	Average Annual Rainfall
e	0.9	Yield Coefficient
h	0.9	Hydraulic Filter Efficiency

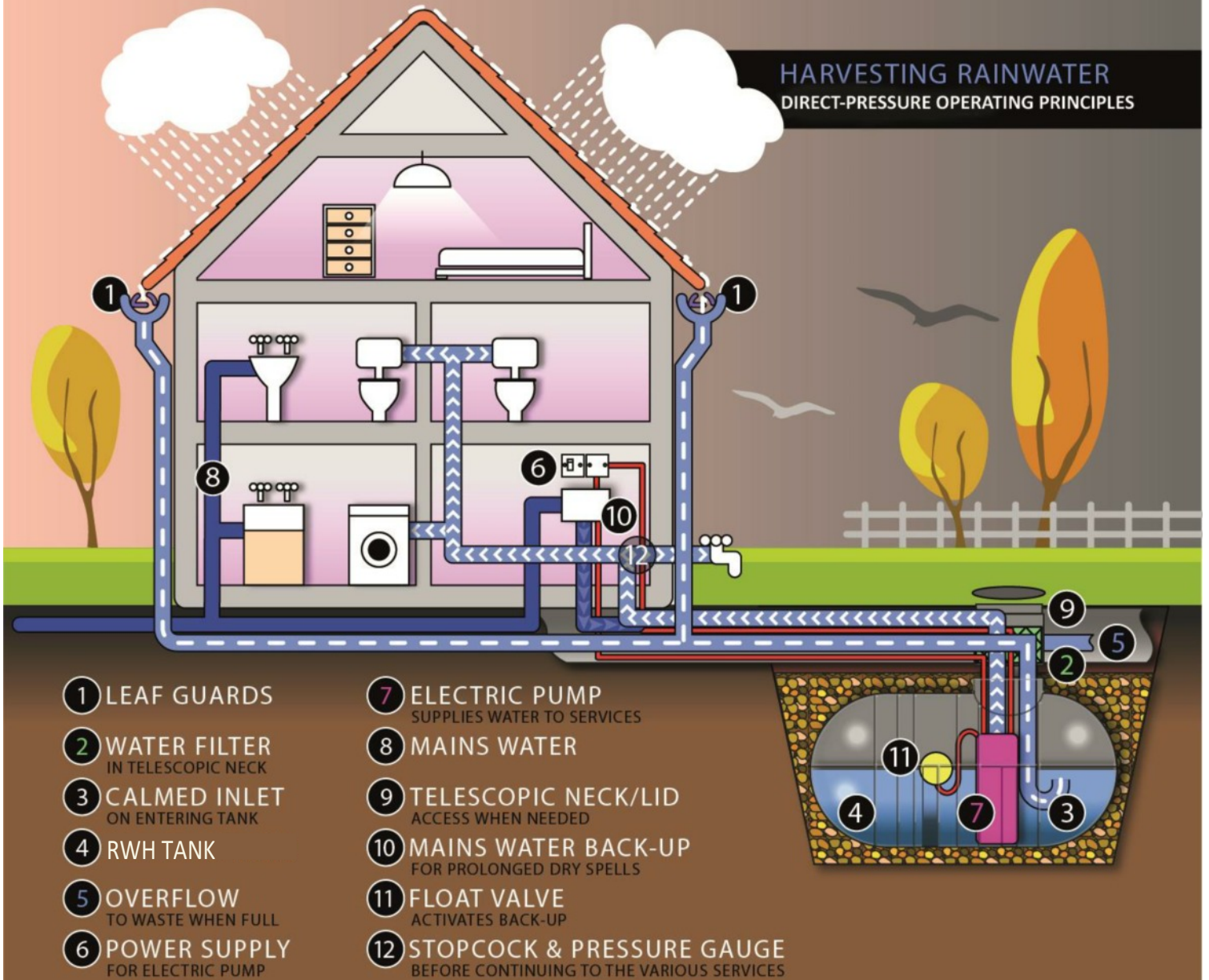
Plot No.	Roof Area (m ²)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Tank Size (litres)
Farm	109	6,374	2,850	3,200

Average Daily Yield (litres)	Daily Demand (litres)
181.90	81.34

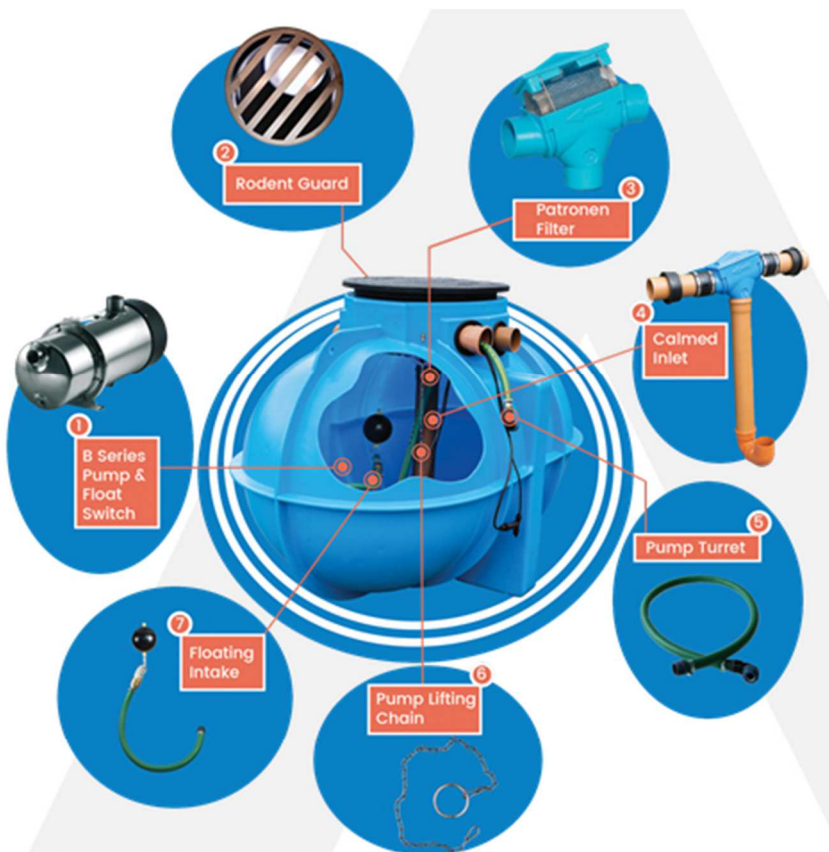
Appendix F

Rainwater Harvesting Specification

HARVESTING RAINWATER DIRECT-PRESSURE OPERATING PRINCIPLES



DIRECT PRESSURE SYSTEM HOME & GARDEN



Inside the Household

Top Up Controller



Automatic mains water top-up Controller kit for rainwater tanks with pump isolation and alarm. The system detects when the tank contents level is running low and initiates a mains top up procedure to ensure the tank never runs out of water supply.

SYSTEM:

A Direct Pressure System is the most popular, cost effective and risk-free option for rainwater harvesting. It can be used for both garden and household applications, for example, it can be used in buildings with a small block of toilets, and for garden irrigation and machine washdowns. The system sends pressurised water straight from the external tank directly to the application. If the water level in the tank gets too low, the top up controller will activate a mains top up so the tank doesn't empty.

COMPONENTS

P Series pumps are stainless steel pumps with plastic coverings and are suitable for domestic water systems, rainwater harvesting, tanks, surface irrigation and tank transfer.

The rodent guard protects the internal water from rodents and large debris which could contaminate the water entering via the overflow.

The PF filter is designed with a level drop, this along with its very smooth surface structure allows excess dirt to be rinsed straight through to the overflow. The filter cartridge mesh is stainless steel within plastic housing and is self-cleaning, though regular inspection is recommended.

The calmed inlet removes the kinetic energy from the water as it enters the tank. This means that as the water enters it doesn't stir up the contents of the tank.

The turret set provides the connection between the pump and the pipework leading to the various external applications. They are made from a flexible plastic so can easily deal with the pressurised water coming from the pump.

The pump lifting chain aids in servicing the pump as it allows the pump to be easily pulled up towards the top of the tank.

A floating intake ensures that no water from either the bottom or the surface of the tank is taken in. Meaning only clean water passes through the system and is pumped into the household.

ADDITIONAL SPECIFICATIONS

- Service duct
- Delivery hose (Options available)
- Top up controller
- Tanks sold separately
- Extra overflow on tanks 5600 – 10000

POPULAR USE:

- Garden irrigation
- Cleaning the car
- Washing windows
- Power washing drive/patio
- Outside tap and hosepipe
- Flushing toilets
- Drinking water (if tank is potable)
- Washing machine



Appendix G

Meter Readings

Meter Readings
Farm Water Meter

Start Date	Reading	Days	Difference (m ³)	Difference (litres)	litres per day
28/01/2020	33,671				
15/01/2021	34,771	353	1,100	1,100,000	3,116
15/10/2021	36,088	273	1,317	1,317,000	4,824
12/01/2022	36,261	89	173	173,000	1,944
28/06/2022	36,706	167	445	445,000	2,665
09/01/2023	37,226	195	520	520,000	2,667
		1077	3,555	3,555,000	3,301 litres per day average

The Granary

Start Date	Reading	Days	Difference (m ³)	Difference (litres)	litres per day
08/06/2018	0				
10/07/2019	91	397	91	91,000	229
07/03/2020	145	241	54	54,000	224
11/01/2021	226	310	81	81,000	261
18/01/2022	328	372	102	102,000	274
07/07/2022	375	170	47	47,000	276
10/01/2023	420	357	92	92,000	258
		1847	467	467,000	253 litres per day average

The Barns

Start Date	Reading	Days	Difference (m ³)	Difference (litres)	litres per day
11/06/2018	0				
19/07/2019	223	403	223	223,000	553
11/01/2021	583	542	360	360,000	664
10/02/2022	775	395	192	192,000	486
		1340	775	775,000	578 litres per day average

Deers Leep

Start Date	Reading	Days	Difference (m ³)	Difference (litres)	litres per day
22/06/2018	4,475				
10/07/2019	4,663	383	188	188,000	491
08/03/2020	4,793	242	130	130,000	537
11/01/2021	4,959	309	166	166,000	537
18/01/2022	5,196	372	237	237,000	637
		1306	721	721,000	552 litres per day average

Average farm use after removal of above properties:

1,918 litres per day average

Appendix H

Meter Reading Photos

Farm



28/01/2020



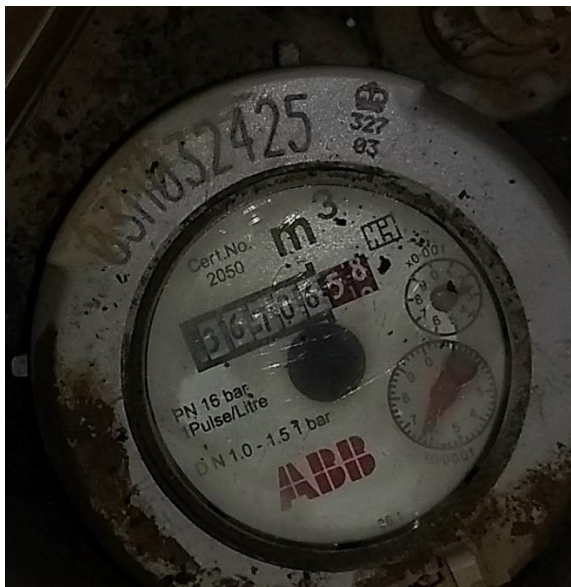
15/01/2021



15/10/2021



12/01/2022



28/06/2022



09/01/2023

The Granary



10/07/2019



11/01/2021



07/07/2022



10/01/2023

The Barns



19/07/2019



11/01/2021

Deers Leep



10/07/2019

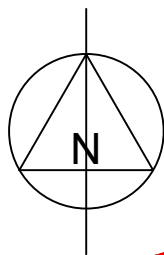


11/01/2021

Appendix I

Farm Rainwater Harvesting Plan

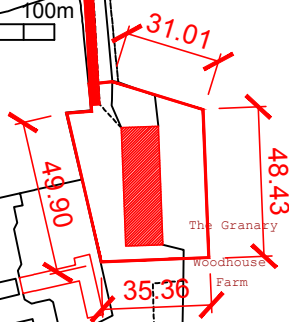
WOODHOUSE FARM BARN,
WHEATSHEAF ROAD,
WOODMANCOTE BN5 9BA
LOCATION PLAN 1:2500
(sheet 2 of 2) revision A



Rainwater Harvesting System for
farm to be installed on existing barn

0m 100m

PLOT AREA = 1595m²
building area = 460m²



Stonelands Farm

Pond

15.3m

Deers Leap

Pond

Track

Cattle Grid

Cattle Grid

Cattle Grid

Woodhouse Farmhouse

The Barns

18.9m

Drain

19.3m

Swallow Cottage

South Cottage

Appendix J

Farm Rainwater Harvesting Calculation

Rainwater Harvesting System (BS8515 - Intermediate Approach)

AAR	752	Average Annual Rainfall
e	0.9	Yield Coefficient
h	0.9	Hydraulic Filter Efficiency

Plot No.	Roof Area (m ²)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Tank Size (litres)
Farm	445	26,022	67,192	26,500

Average Daily Yield (litres)	Daily Demand (litres)
742.63	1,917.57