Water Neutrality Offsetting Scheme

Timberley Farm, Bury

CONFIDENTIAL

Prepared on 31st October 2024

Updated on 10th February 2025

Appendices

1. Appendix i - Timberley Farm Brochure
2. Appendix ii - Water Bills since 2018
3. Appendix iii - Timberley Farm 2023 cow data
4. Appendix iv - ST20485 - Water Neutrality - Final - v2.0

Introduction

This supplemental report has been produced as a Confidential document, that is not for the public record, due to the commercial sensitivities linked with the legal agreements required to tie in the 'offsetting' site with this application and others within the District.

This document should be read in conjunction with the Motion Water Neutrality Statement dated 26 September 2024.

The Offsetting Site

Timberley Farm is located in Bury, Pulborough and comprises a historic agricultural holding of some 437 Acres, providing buildings and significant areas of grazing land for cattle and sheep. (please see full details at Appendix i)

The farm is located within the Sussex North Water Resource Zone and is currently drawing significant potable water resources from the abstraction site at Hardham.

Baseline Water Usage

The existing farm is supplied by one main water meter (with four sub-water meters for non-agricultural uses), with the primary water meter (ref 95A130587) indicating an average consumption of approximately seven million litres per annum as set out within the attached Southern Water Meter Reading at Appendix ii. The below table summarises the water meter readings from the water bills:

Table 1 - Average Daily Water Use of Timberley Farm based on Water Meter Bills

Time Period covered by Water Bill	Water Use (litres)	Average Water Use per day (litres)
23 March 2018 – 2 October 2018	4,435,000	22,861
3 October 2018 – 4 March 2019	3,125,700	20,429
5 March 2019 – 12 August 2019	3,423,500	21,233
13 August 2019 – 18 February 2020	3,985,200	20,975
24 March 2020 – 30 September 2020	4,019,400	21,044
24 February 2021 – 20 August 2021	2,973,300	19,923
21 August 2021 – 25 February 2022	3,546,300	19,086
19 August 2022 – 20 February 2023	3,160,900	18,681

The additional four sub-water meters facilitate the farmhouses/dwellings at the property, and the annual readings for these dwellings are set out in the table below:

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Table 2 - Annual Water Use of Non-Agricultural Uses (Dwellings) at Timberley Farm

Date of Water Bill	Annual Water Use (litres)
May 2020	1,146,000
March 2021	1,027,000
April 2022	943,000

As set out in Table 1, the annual water usage of the farm equates to approximately seven million litres a year. Table 2 sets out that of this seven million, approximately one million litres is consumed by non-agricultural uses on the site (dwellings etc).

Therefore, the main draw on the potable water resource comes from agricultural uses, particularly livestock on the farm, comprising cattle and sheep.

Appendix iii details a Continuous Herd Record for 2022, and states that,

'on average there are between 230 and 250 cattle at the farm permanently throughout the year and this number rises by 150 extra cattle during the Summer months.

With regards to sheep numbers. This varies from 50 animals in Winter and up to 1,000 during the summer months.'

On the basis of the detail in Appendix iii, the average number of cattle and sheep is outlined below.

Cattle - Approximately 289 cattle

(Winter months: 240 x 30days x 8months = (a) 57,600 cows / Summer months: 400 x 30days x 4months = (b) 48,000cows) (a+b / 365days = 289 cattle)

Sheep – Daily average of 353 animals

50 animals in winter months / up to 1000 animals in summer months

Based on DeFRA (UK) and DeAERA (Northern Ireland) baseline data, we have estimated that the level of water usage associated with livestock would be as follows to produce an annualised consumption from livestock;

- Beef Cattle @ 45 litres per day (averaged across male/female/calves consumption)
- Sheep @ 4.5 litres per day (averaged across pregnant/non-pregnant ewes)

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Table 3 - Annualised Water Consumption for Livestock

Stock	Average daily l/d	Timberley Farm Stock Average	Estimated Daily Consumption Litres	Estimated Consumption per Annum
Sheep	4.5	353	1588.5	579,802.5
Beef	45	289	13,005	4,746,825
Total			14,593.5	5,326,627.5

Such water consumption aligns with the annualised water meter readings for the farm at circa seven million litres per annum, when aligned with the other operational uses on site. (dwellings etc)

The offset for the purposes of achieving water neutrality are therefore reasonably considered to be approximately Six Million Litres Per annum associated with livestock, cleaning, maintenance etc..

Water Offsetting Scheme;

As set out in the Wardell Armstrong Hydrogeological Conceptual Site Model Report dated 19 September 2023. (see Appendix iv) Timberley Farm benefits from an existing abstraction well (borehole) that has been '*…proven to circa 7 million litres…"5 (7,000 m3/year or approximately 19 m3/day), which equates approximately to the daily maximum volume of groundwater that can be abstracted without a licence from the Environment Agency.'* The abstraction well has not been used operationally.

The report confirms that the abstraction well would draw water from the Folkestone Formation below Timberley Farm and would not impact on water levels in the SSSIs in the vicinity of the River Arun.

In this regard, the report clearly states*; ' ..operating the abstraction well at Timberley Farm at an abstraction rate of 15 m3/day (15,000 litres) would not have a significant effect on water levels in the nearby SSSIs and that it would be suitable for use in offsetting towards water neutrality.'*

The extraction well would be utilised for all water associated with the livestock operation at Timberley Farm, with water from this source redirected to all necessary buildings/drinking troughs an etc across the farm. The non-agricultural uses on the farm would continue to utilise water mains.

Full details of such systems can be secured by appropriate drafted conditions/obligations.

Required Offsetting for development;

As set out in the Updated Planning Pack Cover letter dated 4 February 2025, the development proposes to provide a total of 29 units, comprising a housing mix of two one-bed units, six two-bed units, 11no. three-bed units and ten four-bed units.

Tthe updated water consumption figure to be offset for the proposed development will be **5,111.85 litres per day**.

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Water efficiency measures are incorporated into both the market and affordable units across the development, to reduce the overall scheme water demand to 5,111.85 litres per day or 1,865,825 litres per annum

Based therefore on the available 15,000 litres per day or 5,475,000 litres per annum provided by the extraction well at Timberley Farm, the Furners Lane site can be 'offset' entirely, with additional capacity maintained for a further 9,888 litres per day of 'offsetting' water consumption associated with the use of the extraction well.

Summary

In summary, Timberley Farm currently draws significant water from the Hardham extraction zone via the mains system, which can be offset through the use of an existing extraction well on site.

The extraction well provides capacity for circa 15,000 litres per day, which exceeds the 14,593.5 litres per day requirements for livestock alone.

Switching drinking water supplies for the livestock to the extraction well, will therefore seek to provide the necessary offsetting of mains water usage on site.

Based solely on the requirement to offset 5,111 litres per day associated with the 29 new dwellings at Furners Lane, Henfield it is considered that appropriate offsetting can be achieved via the extraction well at Timberley Farm, with significant headroom available for other development offsetting.

Full details of the implementation of works to utilise the extraction well and subsequent auditing of the reduction in potable water use on site can be secured by appropriately worded conditions/obligations on the landowner and developer.

Further to the above, it has been agreed with the Horsham District Council EHO that water quality testing for the borehole is not required, as the borehole is used solely for watering animals and washing down the areas where the animals are housed. Therefore a Risk Assessment is not required. Following implementation of the borehole, the mains supply for watering animals and washing down areas where animals are housed will cease.

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Appendix i

Timberley Farm

Bury, Pulborough, West Sussex RH20 1NP

Batcheller Monkhouse

Timberley Farm

A superbly located West Sussex country estate which has been in the same family ownership for about 60 years.

- Fabulous Location
- Panoramic Views of the South Downs and Amberley Castle
- Approached by its own Private Drive
- 8 Bedroom Grade II Listed Principal House
- Separate Flat and Garaging
- Games Room, Swimming Pool and Tennis Court
- Pair of Farm Cottages
- Traditional Range of Farm Buildings
- Modern Range of Livestock Buildings
- Exceptional Private Shoot

London about 53 miles **Pulborough about 4 miles** **Chichester about 12 miles**

FOR SALE AS A WHOLE BY PRIVATE TREATY

IN ALL APPROXIMATELY 437 ACRES

"The View"

SITUATION

Timberley Farm is found in a stunning rural location with the house and buildings set within their own land and approached via a private drive of some two thirds of a mile. There are panoramic views over the Arun Valley to the South Downs, further views over a railway viaduct to Amberley Castle and village, and there are no known public paths running through the estate.

The small attractive village of Bury lies closeby to the south and the larger village of Pulborough about 4 miles to the north east with good local shops and a mainline railway station to London Victoria.

The historic city of Chichester is about 12 miles to the south west with many interesting shops and the renowned Festival Theatre. Central London is about 53 miles and Gatwick Airport is conveniently accessible to the north.

Recreational opportunities include golf at the West Sussex Club at Pulborough, Horse and Motor Racing at Goodwood, Racing at Fontwell, Polo at Cowdray Park and sailing at Chichester Harbour.

In addition the area is well served with good schools.

DESCRIPTION

Timberley Farm provides an increasingly rare opportunity to acquire a complete country estate in the heart of West Sussex with a house and buildings set within their own land. The estate has been it the same family ownership for the last 60 years, having formally been part of the Duke of Norfolk's Estate.

Timberley Farmhouse: This is a Grade II listed property which is understood to have been originally built in 1815 with local flint elevations with brick quoins and reveals in the older part, and was substantially extended in the early 1960's. It is set within its own garden and with the majority of the principle rooms south facing, full advantage is taken of the views over brookland to the South Downs and Amberley Castle. The front door leads to an entrance hall which provides access to the well proportioned reception rooms of which there are four, including a particularly fine drawing room and dining room. There is a farmhouse style kitchen/breakfast room, utility areas and a cellar. The first floor offers a total of eight bedrooms, two bathrooms and roof terrace from which the views can be savoured. The house is ideal for family accommodation or for entertaining.

Outside there is parking sweep to the front and ample parking behind the house. The garden provides a lovely setting and includes a swimming pool, and to north lies a tennis court, detached building with garaging, storage and a first floor games room; further garage building with first floor flat over and garden stores.

1 and 2 Timberley Farm Cottages: These are located to the north of the drive in a slightly elevated position and again benefit from the stunning downland and countryside views. They comprise a pair of brick and tile semi-detached cottages, each providing a sitting room, kitchen/ dining room and three first floor bedrooms.

The Farm Buildings: The farm buildings lie predominantly to the north west of the house, and include a traditional range of brick and flint outbuildings, partly forming a courtyard and a fine period flint barn. It is believed that these offer scope for alternative uses such as holiday lets, if required (subject to all prior consents being obtained).

In addition there are a range of modern farm buildings approached via a separate spur from the main drive which comprise:

- A 7 bay steel framed stock barn
- A mono pitched 5 bay stock barn with solar panels
- A brick cow shed
- A dutch barn
- A steel framed Hill barn

There is also a separate off lying Atcost barn with large area of hardstanding to the side.

The Land: The land lies in a single block, bisected by the railway line. Being predominantly grass it is stock farmed and includes gently undulating pasture fields as well as some rich brookland summer pastures. The grassland is interspersed with a number of woodland copses and duck flighting ponds which have supported an exceptional private pheasant and mixed wildfowl shoot including some snipe drives.

The land extends in all to approximately 437.3 acres (177.0 hectares) and is divided as follows:

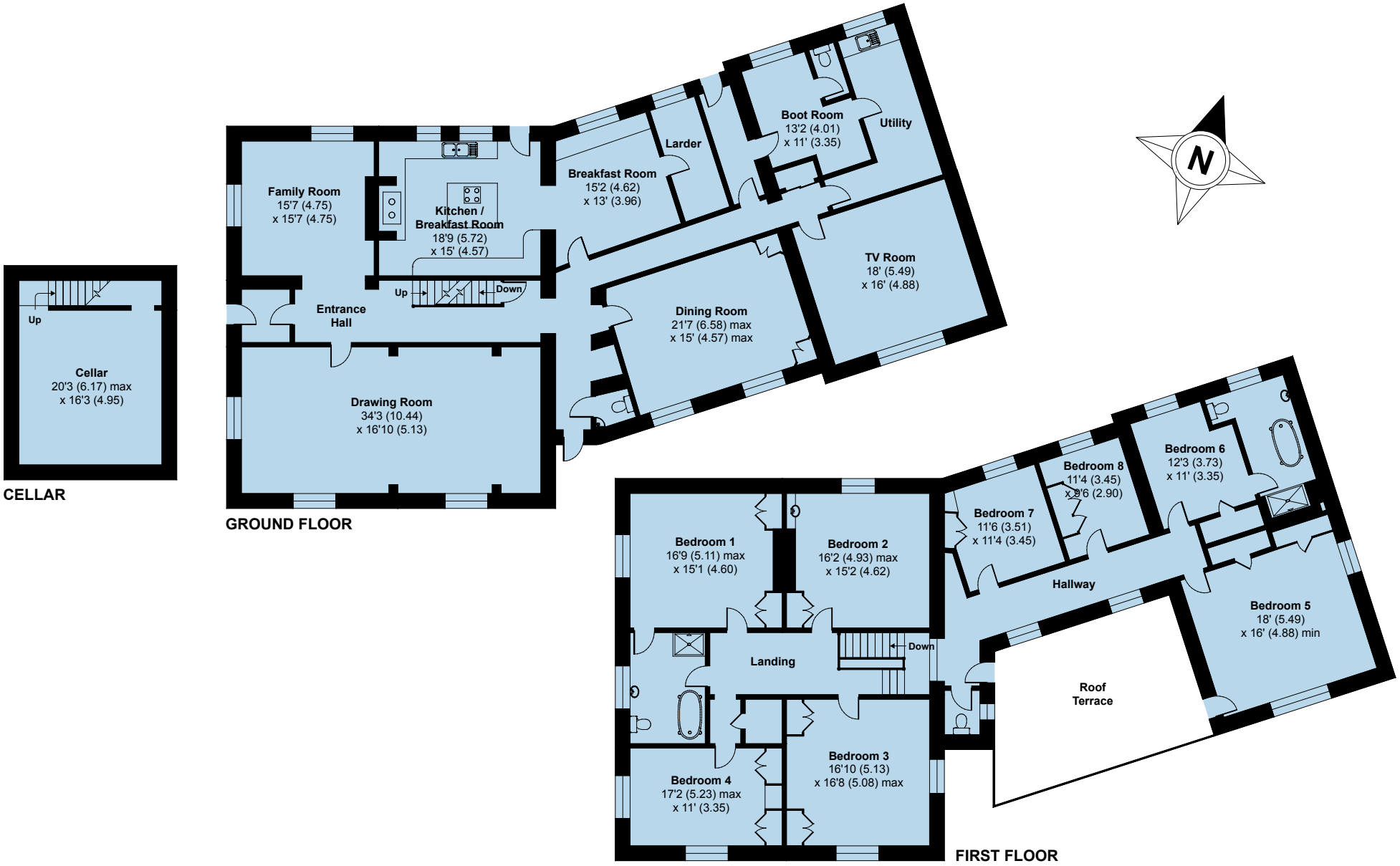
Grassland and Brookland –	**353.4 acres (143.0 hectares)**
Woodland –	**64.5 acres (26.1 hectares)**
Railway line and Cutting –	**6.2 acres (2.6 hectares)**
Houses, Buildings, Ponds, Drive Etc –	**13.2 acres (5.3 hectares)**

DIRECTIONS (RH20 1NP)

From Pulborough proceed for approximately 3.5 miles southwards on A29 towards Chichester and Fontwell and immediately after passing a small petrol filling station on the right, turn left into the entrance drive of the Estate.

Timberley Farm, Bury Common, Bury, Pulborough, RH20 1NP

APPROX. GROSS INTERNAL FLOOR AREA 5728 SQ FT 532.1 SQ METRES



Whilst every attempt has been made to ensure the accuracy of the floor plan contained here, measurements of doors, windows and rooms are approximate and no responsibility is taken for any error, omission or misstatement. These plans are for representation purposes only as defined by RICS Code of Measuring Practice and should be used as such by any prospective purchaser. Specifically no guarantee is given on the total square footage of the property if quoted on this plan. Any figure given is for initial guidance only and should not be relied on as a basis of valuation.

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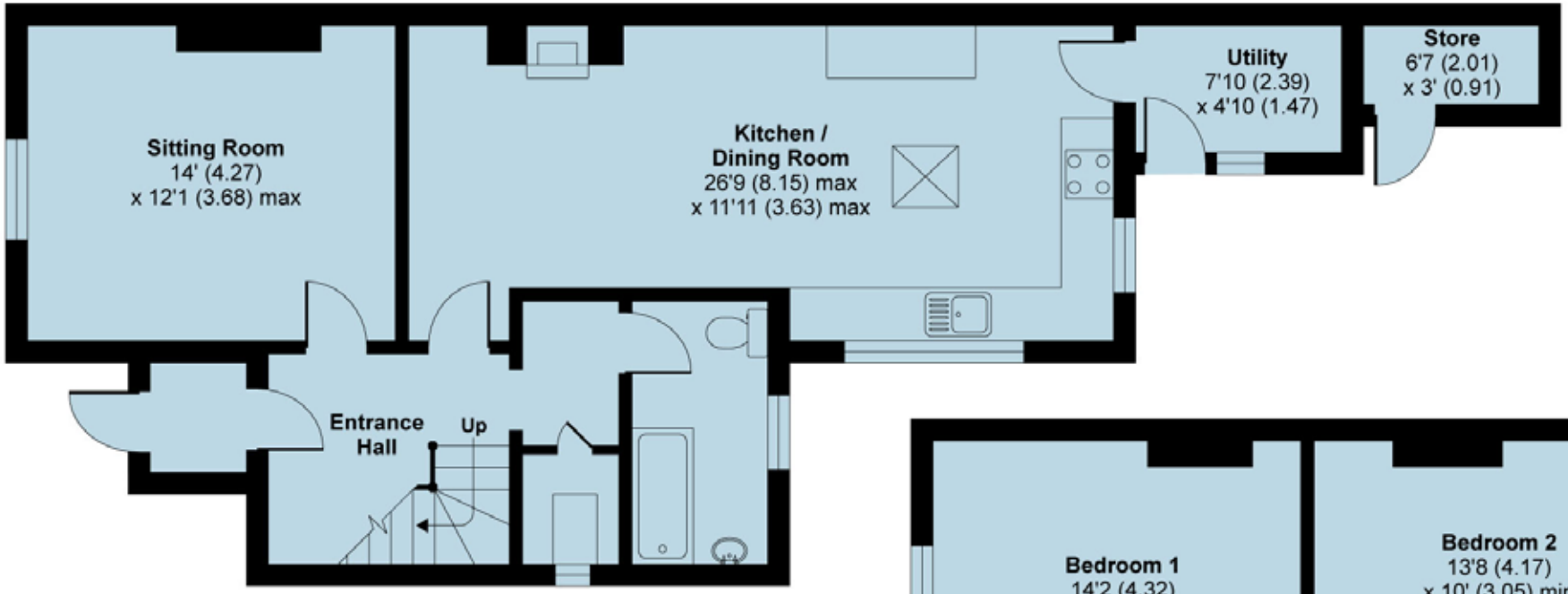
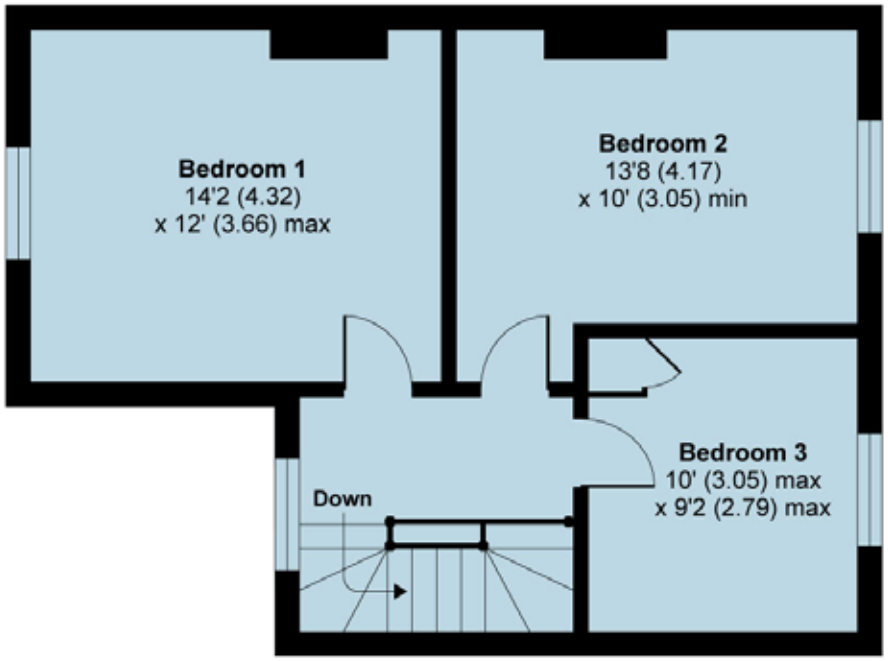
1 Timberley Cottages, Bury Common, Bury, Pulborough, RH20 1NP

APPROX. GROSS INTERNAL FLOOR AREA 1220 SQ FT 113.3 SQ METRES (EXCLUDES STORE)



GROUND FLOOR



FIRST FLOOR

Whilst every attempt has been made to ensure the accuracy of the floor plan contained here, measurements of doors, windows and rooms are approximate and no responsibility is taken for any error, omission or misstatement. These plans are for representation purposes only as defined by RICS Code of Measuring Practice and should be used as such by any prospective purchaser. Specifically no guarantee is given on the total square footage of the property if quoted on this plan. Any figure given is for initial guidance only and should not be relied on as a basis of valuation.

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ADDITIONAL INFORMATION

Local Authority: South Downs National Park Authority
North Street, Midhurst GU299DH.
Telephone: 01730 814810 Email: info@southdowns.gov.uk

Rights and Easements: The property is sold subject to and with the benefit of rights, including rights of way, whether public or private, light, support, drainage, water, gas and electricity supplies and any other wayleaves or easements.

Plans and Areas: These are based on the Ordnance Survey and are for reference only. The purchaser should be deemed to have satisfied himself as to their accuracy and any error or mis-statement shall not annul the sale or entitle any party to compensation in respect thereof. N.B. The plan and acreage includes the railway line, which falls within the Land Registry title, but may not be owned.

Services (not checked or tested): Water - Mains metered supply. Electricity - Mains supply with a number of meters. Drainage - Private drainage serving the house and flat and recently installed private drainage system for the cottages.

Council Tax: House - Band H. Orchard Flat - Band B. 1 and 2 Timberley Cottages - each Band D

Links: www.environment-agency.gov.uk, www.highways.gov.uk, www.caa.co.uk, www.landregistry-gov.uk

Tenure: The property is Freehold and registered under Land Registry Title Numbers WSX364048, WSX171410, WSX347190, WSX347188, WSX14833, WSX364675 and WSX178493.

EPC Ratings: 1 Timberley Cottage - E, 2 Timberley Cottage - F, Orchard Flat - G.

A1772/RMP/27.06.2018

VIEWINGS

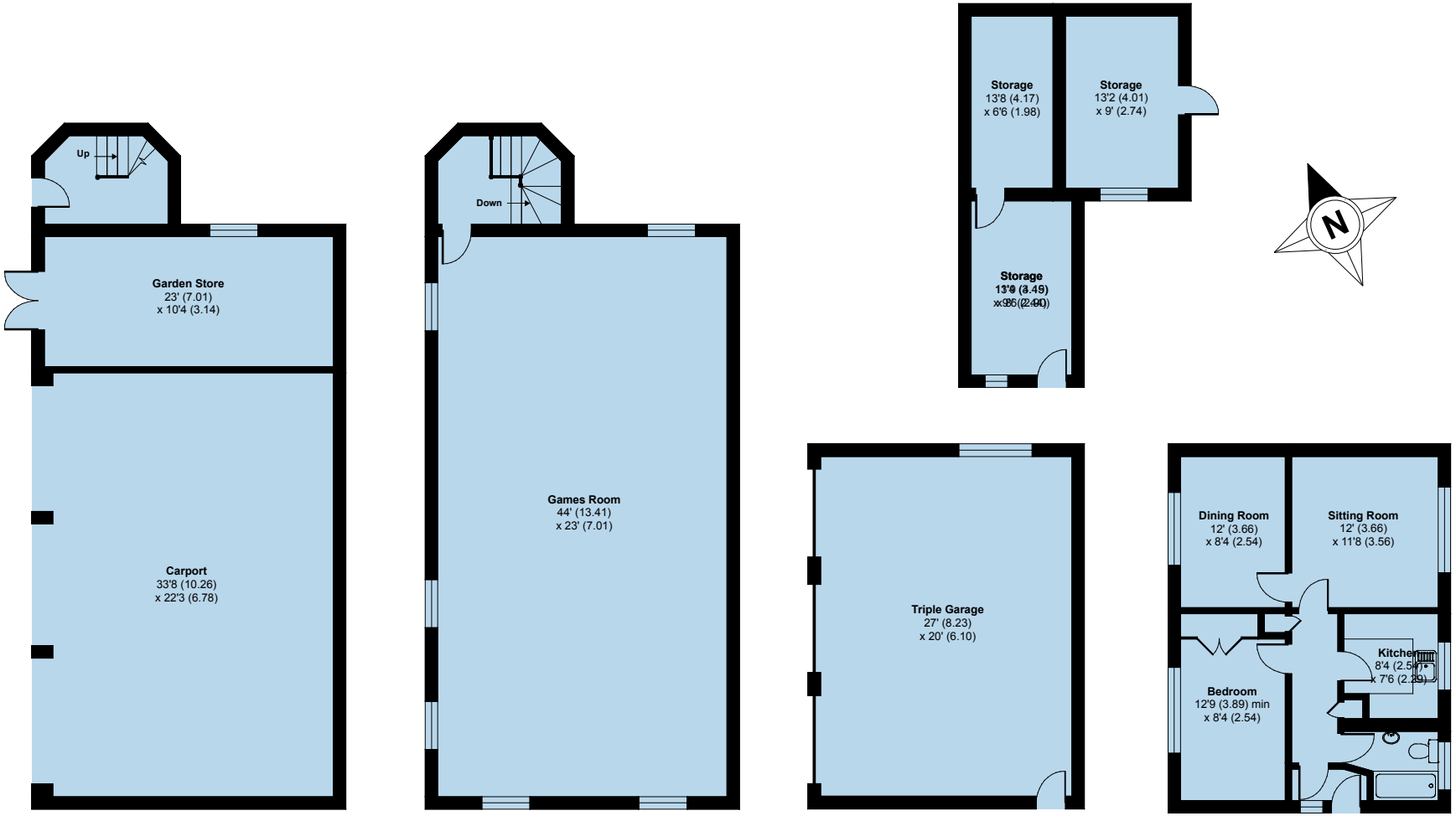
Only by prior confirmed appointment with the Sole Agents:

For an appointment to view please contact our Pulborough Office

T 01798 872081 E sales@batchellermonkhouse.com

Timberley Farm, Bury Common, Bury, Pulborough, RH20 1NP

APPROX. GROSS INTERNAL FLOOR AREA 2854 SQ FT 265.1 SQ METRES



OUTBUILDING GROUND FLOOR | OUTBUILDING FIRST FLOOR | GARAGE | ANNEXE

Whilst every attempt has been made to ensure the accuracy of the floor plan contained here, measurements of doors, windows and rooms are approximate and no responsibility is taken for any error, omission or misstatement. These plans are for representation purposes only as defined by RICS Code of Measuring Practice and should be used as such by any prospective purchaser. Specifically no guarantee is given on the total square footage of the property if quoted on this plan. Any figure given is for initial guidance only and should not be relied on as a basis of valuation.

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NOTE:

Batcheller Monkhouse give notice that:

1. These particulars including text, photographs and any plans are for the guidance of prospective purchasers only and should not be relied upon as statements of fact;

2. The particulars do not constitute any part of a Contract;

3. Any description provided herein represents a subjective opinion and should not be construed as statements of fact;

4. A detailed survey has not been carried out, nor have any services, appliances or specific fittings been tested;

5. All measurements and distances are approximate;

6. We strongly advise that a prospective purchaser should contact the agent to check any information which is of particular importance, particularly for anyone who will be travelling some distance to view the property;

7. Where there is reference to planning permission or potential, such information is given in good faith. Purchasers should make their own enquiries of the relevant authority;

8. Any fixtures & fittings not mentioned in the sales particulars are excluded from the sale, but various items may be available, subject to separate negotiation.

EQUESTRIAN property4sale.com

OnTheMarket.com

Battle
01424 775577
battle@batchellermonkhouse.com

Haywards Heath
01444 453181
hh@batchellermonkhouse.com

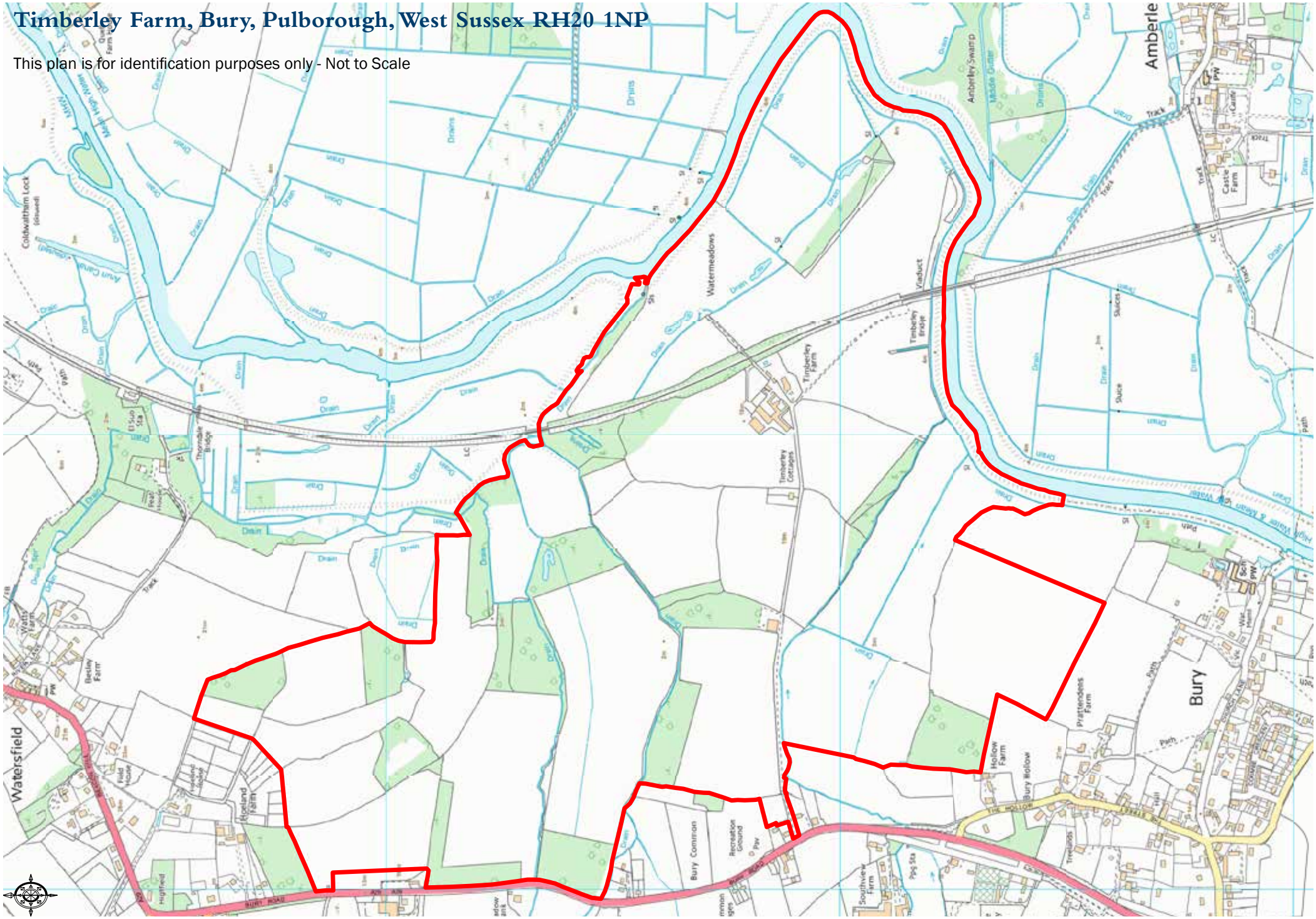
Pulborough
01798 872081
sales@batchellermonkhouse.com

Tunbridge Wells
01892 512020
twells@batchellermonkhouse.com

London
Mayfair Office
mayfair@batchellermonkhouse.com

Timberley Farm, Bury, Pulborough, West Sussex RH20 1NP

This plan is for identification purposes only - Not to Scale



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Appendix ii

Southern Water

15 OCT 2018

Need to get in touch? go to

southernwater.co.uk
0330 303 0277

Weekdays - 8am to 7pm, Saturday - 8.30am to 2pm

385C

Mr JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

50841PFKJ00045/61/C

Your customer number
11117853

Payment reference
1211 4891 00035

Date 09 Oct 2018

Your metered bill for 23 March 2018 to 02 October 2018

This is a summary of your bill for water supplied to:
TIMBERLEY FARM BURY COMMON BURY RH20 1NP

Your prompt payment is appreciated

Payment is due by 23 October 2018

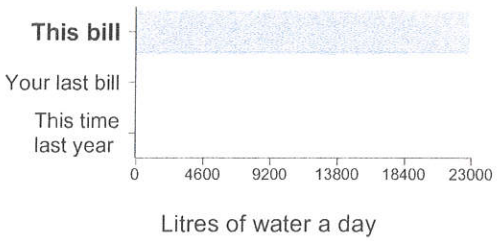
Your account summary

What you've been charged for From 23 March 2018 to 02 October 2018	£6,054.02
Amount to pay now	**£6,054.02**

2693 IVC B UK 30521 5476.2.1

Your water use

Over the last seven months your household used on average **22861** **litres** a day



Water use in a typical household

Number of people in the household	Litres each day
1	178
2	274
3	370
4	438
5	493
6	548

Reduce the water used to flush your toilet

To save a litre with every flush just install a Save-a-flush bag. These are free for our customers.

Installing a Save-a-flush bag can save £6 per person off your annual water bill.

To receive your **free** 'save-a-flush' device, go to our website **www.southernwater.co.uk**

If you're using less water than the typical household, thank you for using water wisely

Your meter reading

Meter number 95A130587

Latest reading

9 8 0 7 6 0 0 Read on 2 Oct 2018

Want to give us a reading?
Please call **0330 303 0277** or go to **southernwater.co.uk/myaccount**
You'll need your customer number.

Previous reading

9 3 6 4 1 0 0 Read on 22 Mar 2018

Cubic metres of water used

4 4 3 5 . 0 0

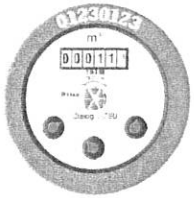
How to read your meter

Taking a meter reading is generally easy to do.

How to read your meter

1. Lift the plastic or metal lid to your meter. You may need to use something like a screwdriver to lift the lid. Please take care when doing this.
2. If there is a polystyrene plug under the lid, remove this.
3. Your meter has a row of numbers and three dials. You only need to write down the row of black numbers.
4. Replace the polystyrene plug and close the lid. This is important so people do not trip over it.

Example



In this example, the meter reading is 11 cubic metres.

What to do if you live in a flat
If you live in a flat, please do not try and read your outside meter yourself. Instead you should phone us and we will arrange a time to read your meter.

Your meter is currently scheduled to be next read by 01.03.2019

How we worked out your bill

Metered water charges

Period	Cubic metres of water used	Cost for one cubic metre	Cost of water	Standing charge	Total
23 March 2018 to 31 March 2018	205.70	131.00p	£269.47	£0.57	£270.04
01 April 2018 to 02 October 2018	4229.30	136.50p	£5,772.99	£10.99	£5,783.98

Total charges for 23 March 2018 to 02 October 2018 £6,054.02

Your questions answered

We supply your water and take away your wastewater

What is a cubic metre?
One cubic metre is 1,000 litres (220 gallons) this is equivalent to approximately 500 kettles, 12 baths or 30 standard showers.

What is the standing charge?
There are certain costs that do not depend on how much water customers use. These costs include, for example, the cost of sending bills, collecting payments and dealing with enquiries. The standing charges covers these costs.

Why are there two different periods?

The bill includes price changes effective from 1st April for both variable and standing charge

Southern Water

Need to get in touch? go to

southernwater.co.uk
0330 303 0277

Weekdays - 8am to 7pm, Saturday - 8.30am to 2pm

13 MAR 2019

385C

Mr JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

50841XMKC00073/87/C

Your customer number
11117853

Payment reference
1211 4891 00035

Date 07 Mar 2019

Your metered bill for 03 October 2018 to 04 March 2019

This is a summary of your bill for water supplied to:
TIMBERLEY FARM BURY COMMON BURY RH20 1NP

Your prompt payment is appreciated

Payment is due by 22 March 2019

Your account summary

What you've been charged for From 03 October 2018 to 04 March 2019	£4,275.67
Amount to pay now	**£4,275.67**

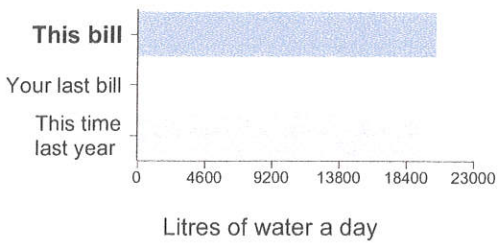
932.

J C Bomhead.

2805 IVC B_UK 41587 9051.2.1

Your water use

Over the last five months your household used on average **20429 litres** a day



Water use in a typical household

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Reduce the water used to flush your toilet

To save a litre with every flush just install a Save-a-flush bag. These are free for our customers.

Installing a Save-a-flush bag can save £6 per person off your annual water bill.

To receive your **free** 'save-a-flush' device, go to our website **www.southernwater.co.uk**

If you're using less water than the typical household, thank you for using water wisely

Your meter reading

Meter number 95A130587

Latest reading

1 2 0 1 7 0 — Estimated on 4 Mar 2019

Want to give us a reading?
Please call **0330 303 0277** or go to **southernwater.co.uk/myaccount**
You'll need your customer number.

Previous reading

9 8 0 7 6 0 0 — Read on 2 Oct 2018

Cubic metres of water used

3 1 2 5 . 7 0

How to read your meter

Taking a meter reading is generally easy to do.

How to read your meter

1. Lift the plastic or metal lid to your meter. You may need to use something like a screwdriver to lift the lid. Please take care when doing this.
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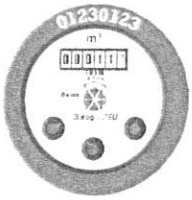
Example



In this example, the meter reading is 11 cubic metres.

What to do if you live in a flat
If you live in a flat, please do not try and read your outside meter yourself. Instead you should phone us and we will arrange a time to read your meter.

Your meter is currently scheduled to be next read by 29.08.2019

How we worked out your bill

Metered water charges

Period	Cubic metres of water used	Cost for one cubic metre	Cost of water	Standing charge	Total
03 October 2018 to 04 March 2019	3125.70	136.50p	£4,266.58	£9.09	£4,275.67

Total charges for 03 October 2018 to 04 March 2019 **£4,275.67**

Your questions answered

We supply your water and take away your wastewater

What is a cubic metre?
One cubic metre is 1,000 litres (220 gallons) this is equivalent to approximately 500 kettles, 12 baths or 30 standard showers.

What is the standing charge?
There are certain costs that do not depend on how much water customers use. These costs include, for example, the cost of sending bills, collecting payments and dealing with enquiries. The standing charges covers these costs.

E-mailed 12/9 12:30

Southern Water

Need to get in touch? go to

southernwater.co.uk
0330 303 0277

Weekdays - 8am to 7pm, Saturday - 8.30am to 2pm

385C

Mr JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

5084115PH00030/115/C

Your customer number
11117853

Payment reference
1211 4891 00035

Date 14 Aug 2019

Your metered bill for 05 March 2019 to 12 August 2019

This is a summary of your bill for water supplied to:
TIMBERLEY FARM BURY COMMON BURY RH20 1NP

Your prompt payment is appreciated

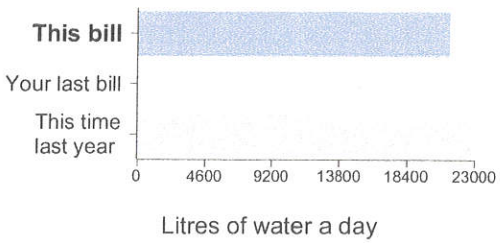
Payment is due by 29 August 2019

Your account summary

What you've been charged for From 05 March 2019 to 12 August 2019	£4,695.89
Amount to pay now	**£4,695.89**

Your water use

Over the last six months your household used on average **21233 litres** a day



Water use in a typical household

Number of people in the household	Litres each day
1	178
2	274
3	370
4	438
5	493
6	548

Reduce the water used to flush your toilet

To save a litre with every flush just install a Save-a-flush bag. These are free for our customers.

Installing a Save-a-flush bag can save £6 per person off your annual water bill.

To receive your **free** 'save-a-flush' device, go to our website **www.southernwater.co.uk**

If you're using less water than the typical household, thank you for using water wisely

2929 IVC B UK 20781 3790 2 1

Your meter reading

Meter number 95A130587

Latest reading

4 6 2 0 2 0 — Estimated on 12 Aug 2019

Want to give us a reading?
Please call **0330 303 0277** or go to **southernwater.co.uk/myaccount**
You'll need your customer number.

Previous reading

1 2 0 1 7 0 — Estimated on 4 Mar 2019

Cubic metres of water used

3 4 1 3 . 5 0

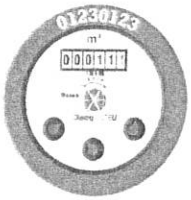
How to read your meter

Taking a meter reading is generally easy to do.

How to read your meter

1. Lift the plastic or metal lid to your meter. You may need to use something like a screwdriver to lift the lid. Please take care when doing this.
2. If there is a polystyrene plug under the lid, remove this.
3. Your meter has a row of numbers and three dials. You only need to write down the row of black numbers.
4. Replace the polystyrene plug and close the lid. This is important so people do not trip over it.

Example



In this example, the meter reading is 11 cubic metres.

What to do if you live in a flat
If you live in a flat, please do not try and read your outside meter yourself. Instead you should phone us and we will arrange a time to read your meter.

Your meter is currently scheduled to be next read by 28.02.2020

How we worked out your bill

Metered water charges

Period	Cubic metres of water used	Cost for one cubic metre	Cost of water	Standing charge	Total
05 March 2019 to 31 March 2019	573.20	136.50p	£782.42	£1.60	£784.02
01 April 2019 to 12 August 2019	2845.30	137.20p	£3,903.75	£8.12	£3,911.87

Total charges for 05 March 2019 to 12 August 2019 **£4,695.89**

Your questions answered

We supply your water and take away your wastewater

What is a cubic metre?
One cubic metre is 1,000 litres (220 gallons) this is equivalent to approximately 500 kettles, 12 baths or 30 standard showers.

What is the standing charge?
There are certain costs that do not depend on how much water customers use. These costs include, for example, the cost of sending bills, collecting payments and dealing with enquiries. The standing charges covers these costs.

Why are there two different periods?

The bill includes price changes effective from 1st April for both variable and standing charge

Southern Water

10.3.
Aw Spoke to SW. they will need and re-issue.

Need to get in touch? go to

southernwater.co.uk
0330 303 0277

Weekdays - 8am to 7pm, Saturday - 8.30am to 2pm

Mr JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

~~385C~~

50841ITZB00064/83/C

28 FEB 2020

Your customer number
11117853

Payment reference
1211 4891 00035

Date 24 Feb 2020

Your metered bill for 13 August 2019 to 18 February 2020

This is a summary of your bill for water supplied to:
TIMBERLEY FARM BURY COMMON BURY RH20 1NP

Your account summary

What you've been charged for From 13 August 2019 to 18 February 2020	£5,479.21
Amount to pay now	**£5,479.21**

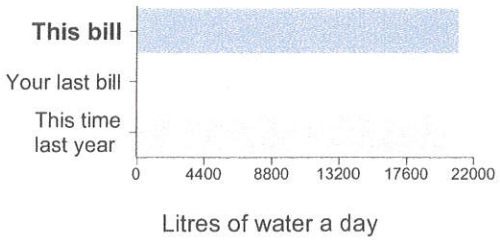
Your prompt payment is appreciated

Payment is due by 10 March 2020

3083 IVC B_UK 34915 7895.2.1

Your water use

Over the last seven months your household used on average **20975 litres** a day



Water use in a typical household

Number of people in the household	Litres each day
1	178
2	274
3	370
4	438
5	493
6	548

Reduce the water used to flush your toilet

To save a litre with every flush just install a Save-a-flush bag. These are free for our customers.

Installing a Save-a-flush bag can save £6 per person off your annual water bill.

To receive your **free** 'save-a-flush' device, go to our website **www.southernwater.co.uk**

If you're using less water than the typical household, thank you for using water wisely

Your meter reading

Meter number 95A130587

Latest reading

8 6 0 5 . 4 0 — Estimated on 18 Feb 2020

Want to give us a reading?
Please call **0330 303 0277** or go to **southernwater.co.uk/myaccount**
You'll need your customer number.

Previous reading

4 6 2 0 . 2 0 — Estimated on 12 Aug 2019

Cubic metres of water used

3 9 8 5 . 2 0

How to read your meter

Taking a meter reading is generally easy to do.

How to read your meter

1. Lift the plastic or metal lid to your meter. You may need to use something like a screwdriver to lift the lid. Please take care when doing this.
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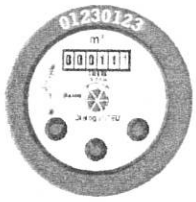
Example



In this example, the meter reading is 11 cubic metres.

What to do if you live in a flat
If you live in a flat, please do not try and read your outside meter yourself. Instead you should phone us and we will arrange a time to read your meter.

Your meter is currently scheduled to be next read by 28.08.2020

How we worked out your bill

Metered water charges

Period	Cubic metres of water used	Cost for one cubic metre	Cost of water	Standing charge	Total
13 August 2019 to 18 February 2020	3985.20	137.20p	£5,467.69	£11.52	£5,479.21

Total charges for 13 August 2019 to 18 February 2020 **£5,479.21**

Your questions answered

We supply your water and take away your wastewater

What is a cubic metre?
One cubic metre is 1,000 litres (220 gallons) this is equivalent to approximately 500 kettles, 12 baths or 30 standard showers.

What is the standing charge?
There are certain costs that do not depend on how much water customers use. These costs include, for example, the cost of sending bills, collecting payments and dealing with enquiries. The standing charges covers these costs.

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Southern Water

19 OCT 2020

Need to get in touch? go to

southernwater.co.uk
0330 303 0277

Weekdays - 8am to 7pm, Saturday - 8.30am to 2pm

Mr JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

385C

508410T0J00016/62/C

Your customer number
11117853

Payment reference
1211 4891 00035

Date 13 Oct 2020

Your metered bill for 24 March 2020 to 30 September 2020

This is a summary of your bill for water supplied to:
TIMBERLEY FARM BURY COMMON BURY RH20 1NP

Your prompt payment is appreciated

Payment is due by 28 October 2020

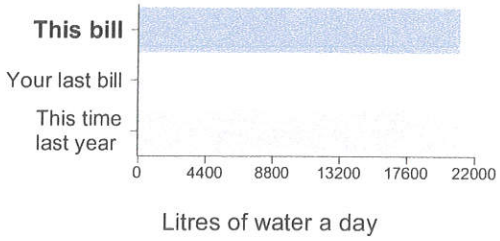
Your account summary

Balance brought forward	£5,431.33
What you've paid since your last bill	£5,479.21 Credit
What you've been charged for From 24 March 2020 to 30 September 2020	£5,733.27
Amount to pay now	**£5,685.39**

Authorised	
Estate/Account	J C Bromhead.
Paid	
Chq.no/Ba...	

Your water use

Over the last seven months your household used on average **21044** **litres** a day



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If you're using less water than the typical household, thank you for using water wisely

Your meter reading

Meter number 95A130587

Latest reading

1 2 5 8 8 4 0 — Estimated on 30 Sep 2020

Want to give us a reading?
Please call **0330 303 0277** or go to **southernwater.co.uk/myaccount**
You'll need your customer number.

Previous reading

8 5 6 9 0 0 — Read on 23 Mar 2020

Cubic metres of water used

4 0 1 9 . 4 0

How to read your meter

Taking a meter reading is generally easy to do.

How to read your meter

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Example

In this example, the meter reading is 11 cubic metres.

What to do if you live in a flat
If you live in a flat, please do not try and read your outside meter yourself. Instead you should phone us and we will arrange a time to read your meter.

Your meter is currently scheduled to be next read by 01.03.2021

How we worked out your bill

Metered water charges

Period	Cubic metres of water used	Cost for one cubic metre	Cost of water	Standing charge	Total
24 March 2020 to 31 March 2020	168.30	137.20p	£230.91	£0.49	£231.40
01 April 2020 to 30 September 2020	3851.10	142.60p	£5,491.67	£10.20	£5,501.87

Total charges for 24 March 2020 to 30 September 2020 £5,733.27

Your questions answered

We supply your water and take away your wastewater

What is a cubic metre?
One cubic metre is 1,000 litres (220 gallons) this is equivalent to approximately 500 kettles, 12 baths or 30 standard showers.

What is the standing charge?
There are certain costs that do not depend on how much water customers use. These costs include, for example, the cost of sending bills, collecting payments and dealing with enquiries. The standing charges covers these costs.

Why are there two different periods?

The bill includes price changes effective from 1st April for both variable and standing charge

WATER for LIFE from Southern Water

Visit our website for live chat or to log into your account
southernwater.co.uk/help

0330 303 0277
Weekdays - 8am to 7pm
Saturday - 8.30am to 2pm

MR JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

0000/01/0000/01000000/3535534
1012050I/001585/001/002

Your customer number
11117853

Your payment reference
1211 4891 00035

Dear Mr JAMES BROMHEAD,

Here's your latest bill based on the meter reading we estimated on 20 August 2021 for: TIMBERLEY FARM, BURY COMMON, BURY RH20 1NP. You currently pay by cash – see page two for your payment options.

Meter reading

Water used in cubic metres

3,546 m³

One cubic metre = 1,000 litres
This is equivalent to: 11 baths, 31 (4 min) showers or 166 toilet flushes

Meter number: 95A130587

Latest reading: 20 Aug 2021

	1	9	1	0	8	0	0

Previous reading: 23 Feb 2021

	1	5	5	6	1	7	0

Your next meter reading is scheduled to take place by 01 Mar 2022

Previous bill's usage
2,973.30 m³

Charges

£5,239.97

Bill date
25 Aug 2021

Billing period
From: 24 February 2021
To: 20 August 2021

Bill type
Metered - Cash

Previous bill's charges
£4,248.07

Future payments

Total payment of

£5,239.97

Due by
11 September 2021

To pay your bill
See how to pay on p. 2

Struggling to pay? See p. 3

Water

Period: 24 February 2021 to 31 March 2021

Variable Rate	£1.426 x	717.20m³	=	£1,022.73
Standing Charge			=	£2.01

Period: 01 April 2021 to 20 August 2021

Variable Rate	£1.487 x	2,829.10m³	=	£4,206.87
Standing Charge			=	£8.36
Total Water				**£5,239.97**

Wastewater

Southern Water only supplies your water – we don't take wastewater away from your property.

So, you don't receive any wastewater charges from us.

Standing Charge:
This covers essential service costs such as sending bills, collecting payments and dealing with enquiries.

822 - M - Document 1 of 1 - 26082021 - 3535479 - 3535534

TA-SWF138-2-1220

Your account summary

What you've been charged for From 24 February 2021 to 20 August 2021	£5,239.97
Amount to pay now	**£5,239.97**

How you can pay

You can pay your bill in many different ways – please choose the one that suits you best.
Your payment reference number is **1211 4891 00035**.

Direct Debit

If you'd like to pay by Direct Debit, you can set one up at **southernwater.co.uk/paying-your-bill.**

Debit and credit card

You can pay by card on our website at **southernwater.co.uk/paying-your-bill** or by phoning **0330 303 1263** (24 hours 7 days a week).

Online or telephone banking

When paying online or by telephone banking, quote your payment reference number on the front of your bill. Our bank sort code is **40 02 50** and account number is **91426907**.

At a bank or post office

You can pay at most banks or post offices using the payment slip over the page. This service is free if you pay at a post office, any HSBC branch or your own bank (except Santander or Halifax).

By post

Complete the payment slip over the page and write a cheque made payable to Southern Water. Then post them together to Southern Water Services, PO Box 564, Darlington, DL1 9ZG.

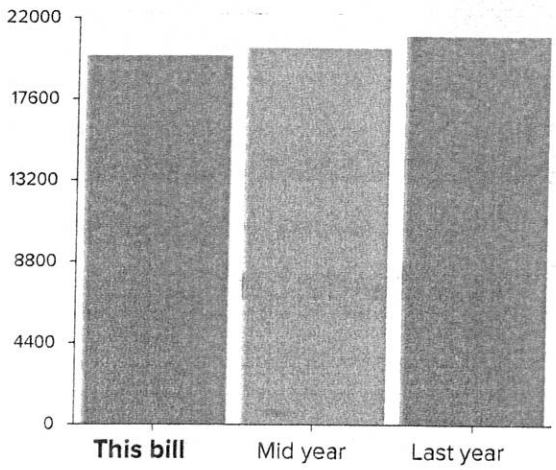
PayPoint

You can pay by cash wherever you see the PayPoint sign. Please take your bill or your payment card with you.

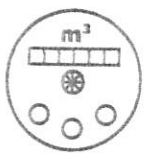
Your water use

Over the last six months your household used an average of 19923 litres a day

You're using £29.60 of water a day on average.



Your water meter is read twice a year. We can read most meters from the street – so you may not have noticed when we read yours.



More information

Struggling to pay?

If you're struggling to pay your bill, we're here to help. Please contact us as soon as possible to talk about the support we can offer you.

0800 027 0363

Payless@southernwater.co.uk

southernwater.co.uk/account/help-paying-your-bill

Moving home?

Please give us at least two days' notice before you move, so we can read your meter.

Alternatively, you can check your meter on the day you leave the property and submit your reading here:

0330 303 0277
Weekdays – 8am to 7pm
Saturday – 8.30am to 2pm

southernwater.co.uk/account/moving-home

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Contact us

Visit our website
You can access your online account and live chat at:
southernwater.co.uk

Call us
0330 303 0277
Weekdays – 8am to 7pm
Saturday – 8.30am to 2pm

Write to us
Southern Water Services
PO Box 564, Darlington
DL1 9ZG

Automated payment line
0330 303 1263
24 hours 7 days a week

We're here to help

Minicom text phone for Deaf people
0330 303 1265
Weekdays – 8am to 7pm
Saturday – 8.30am to 2pm

About your water supply
0330 303 0368
24 hours 7 days a week

Extra care services, braille or talking bills
0800 027 0800
Weekdays – 8am to 7pm

Spotted a leak?
0800 820 999
Freephone lines open
24 hours 7 days a week

We value your privacy

We're committed to safeguarding your information too, which we use:
- to offer water and wastewater goods and services
- to track trends and create customer profiles
- with credit references agencies for credit management purposes
- with neighbouring water companies to complete the billing process.

For more about what we do visit southernwater.co.uk/privacy

If we get something wrong

Our Code of Practice sets out our standards of service and what we'll do if we fail to meet them, including the amount of compensation we'll pay you. For more information visit southernwater.co.uk/cop

DATE

Cashier's Stamp

HSBC Bank Plc
H.O. Collection Account
Southern Water Services Ltd

6331611121148910035

bank giro credit

Reference	Amount due
1211489100035	£ 5,239.97

TIMBERLEY FARM BURY COMMON BURY RH20 1NP

Cash		
Cheques		
£		

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WATER for LIFE from Southern Water

Visit our website for live chat or to log into your account
southernwater.co.uk/help

0330 303 0277
Weekdays - 8am to 7pm
Saturday - 8.30am to 2pm

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11187301/005617/001/002

MR JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

Your customer number
11117853

Your payment reference
1211 4891 00035

Dear Mr JAMES BROMHEAD,

Here's your latest bill based on the meter reading we estimated on 25 February 2022 for: TIMBERLEY FARM, BURY COMMON, BURY RH20 1NP. You currently pay by cash – see page two for your payment options.

Meter reading

Water used in cubic metres

3,607 m³

One cubic metre = 1,000 litres
This is equivalent to: 11 baths, 31 (4 min) showers or 166 toilet flushes

Meter number: 95A130587

Latest reading: 25 Feb 2022

	2	2	7	1	5	2	0

Previous reading: 20 Aug 2021

	1	9	1	0	8	0	0

Your next meter reading is scheduled to take place by 29 Aug 2022

Previous bill's usage
3,546.30 m³

Charges

£5,375.04

Bill date
18 Mar 2022

Billing period
From: 21 August 2021
To: 25 February 2022

Bill type
Metered - Cash

Previous bill's charges
£5,239.97

Future payments

Total payment of

£5,375.04

Due by
01 April 2022

To pay your bill
See how to pay on p. 2

Struggling to pay? See p. 3

Water

Period: 21 August 2021 to 25 February 2022

Variable Rate	£1.487	x 3,607.20m³	=	£5,363.91
Standing Charge			=	£11.13
Total Water				**£5,375.04**

Wastewater

Southern Water only supplies your water – we don't take wastewater away from your property.

So, you don't receive any wastewater charges from us.

Standing Charge:
This covers essential service costs such as sending bills, collecting payments and dealing with enquiries.

1029 - M - Document 1 of 1 - 21032022 - 4059579 - 4059722
STA-SWF138-2-1220

Your account summary

What you've been charged for From 21 August 2021 to 25 February 2022	£5,375.04
Amount to pay now	**£5,375.04**

How you can pay

You can pay your bill in many different ways – please choose the one that suits you best.
Your payment reference number is **1211 4891 00035**.

Direct Debit
If you'd like to pay by Direct Debit, you can set one up at **southernwater.co.uk/paying-your-bill.**

Online or telephone banking
When paying online or by telephone banking, quote your payment reference number on the front of your bill. Our bank sort code is **40 02 50** and account number is **91426907**.

By post
Complete the payment slip over the page and write a cheque made payable to Southern Water. Then post them together to Southern Water Services, PO Box 564, Darlington, DL1 9ZG.

Debit and credit card
You can pay by card on our website at **southernwater.co.uk/paying-your-bill** or by phoning **0330 303 1263** (24 hours 7 days a week).

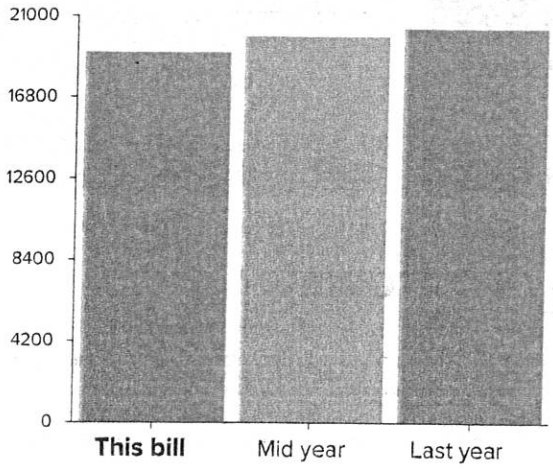
At a bank or post office
You can pay at most banks or post offices using the payment slip over the page. This service is free if you pay at a post office, any HSBC branch or your own bank (except Santander or Halifax).

PayPoint
You can pay by cash wherever you see the PayPoint sign. Please take your bill or your payment card with you.

Your water use

Over the last six months your household used an average of 19086 litres a day

You're using £28.59 of water a day on average.



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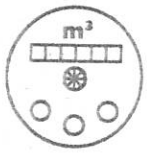

WATER for LIFE from Southern Water

MR JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

77376-000080/01/02-H0

Visit our website for live chat or to log into your account
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0330 303 0277
Weekdays - 8am to 7pm
Saturday - 8.30am to 2pm

Your customer number
11117853

Your payment reference
1211 4891 00035

Dear Mr JAMES BROMHEAD,

Here's your latest bill based on the meter reading we estimated on 20 February 2023 for: TIMBERLEY FARM, BURY COMMON, BURY RH20 1NP. You currently pay by cash – see page two for your payment options.

Meter reading

Water used in cubic metres

3,475 m³

One cubic metre = 1,000 litres
This is equivalent to: 11 baths, 31 (4 min) showers or 166 toilet flushes

Meter number: 95A130587

Latest reading: 20 Feb 2023

	2	9	3	5	0	7	0

Previous reading: 18 Aug 2022

	2	5	8	7	6	1	0

Your next meter reading is scheduled to take place by 29 Aug 2023

Previous bill's usage
3,160.90 m³

Charges

£5,395.22

Bill date
05 Jun 2023

Billing period
From: 19 August 2022
To: 20 February 2023

Bill type
Metered - Cash

Previous bill's charges
£4,869.70

Future payments

Total payment of

£10,264.92

Due by
21 June 2023

To pay your bill
See how to pay on p. 2

Struggling to pay? See p. 3

Water

Period: 19 August 2022 to 20 February 2023

Variable Rate	£1.550 x	3,474.60m³	=	£5,385.63
Standing Charge			=	£9.59
Total Water				**£5,395.22**

Wastewater

Southern Water only supplies your water – we don't take wastewater away from your property.

So, you don't receive any wastewater charges from us.

Standing Charge:
This covers essential service costs such as sending bills, collecting payments and dealing with enquiries.

If you would like to know more about how we calculate our charges, please go to **www.southernwater.co.uk/account/how-we-calculate-your-bill**

1471 - M - Document 1 of 1 - 06062023 - 5423679 - 5423718

Your account summary

Balance brought forward from your last bill	£4,869.70
What you've been charged for From 19 August 2022 to 20 February 2023	£5,395.22
Amount to pay now	**£10,264.92**

How you can pay

You can pay your bill in many different ways – please choose the one that suits you best. Your payment reference number is **1211 4891 00035**.

Direct Debit

If you'd like to pay by Direct Debit, you can set one up at **southernwater.co.uk/paying-your-bill.**

Online or telephone banking

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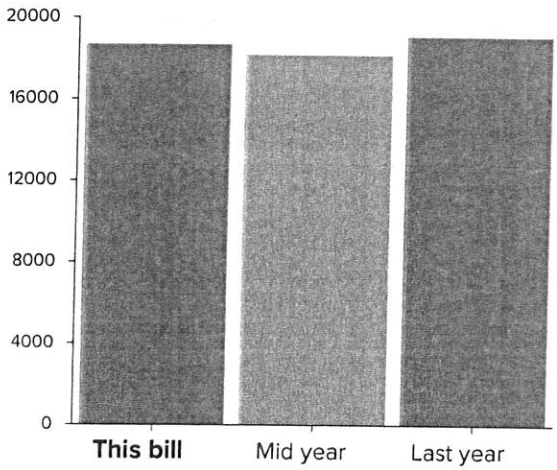
Your water use

Over the last six months your household used an average of **18681** litres a day

You're using £29.16 of water a day on average.

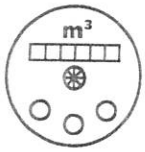


We noticed your water use has increased by 515 litres of water a day on average.

If you use less water, you'll save money on your bill. Find out how you could reduce your usage here:

southernwater.co.uk/save-water

Your water meter is read twice a year. We can read most meters from the street – so you may not have noticed when we read yours.



Southern Water
Ensuring water for life

Customer Number: **0011117853**
Payment Reference: **1211 4891 00035**

Please respond within 14 days

MR JAMES BROMHEAD
PER MONKHOUSE AND BANNISTERS
BARTRAM HOUSE
STATION ROAD
PULBOROUGH
RH20 1AH

Bill for:
TIMBERLEY FARM
BURY COMMON
BURY RH20 1NP
Date: 08 Aug 2023

0000/01/0000/10000000/5623815
13889401/006223/001/001

Reminder

Outstanding balance: £10,264.92

Hello, it's time to bring your account up to date

We're getting in touch about the outstanding balance of £10,264.92. It's really important that you take action today by choosing one of the two options below.

If you've already paid your bill, you don't need to do anything. It can take up to 7 days for payments to reach your account. You can check your balance at any time by logging in at southernwater.co.uk and creating an online account.

It's important to act so that we can provide help if you need it

If we don't hear from you by 09 September 2023, we'll need to take the following actions:

- Register a default on your credit file, which is likely to affect your credit score and your ability to obtain credit.

However, before this date we may pass your account to a debt collection agency who will contact you for payment. You must contact us within 14 days to avoid this.

Option 1: I'm ready to settle my balance

To settle your balance today, you just need:

- Payment reference number 1211 4891 00035
- A debit or credit card

Make a payment online

Visit southernwater.co.uk

Prefer to call?

Our automated payment line is available 24/7. Just call 0330 303 1263.

If you'd rather pay another way, just turn over the page for more options to settle your balance.

Option 2: Set up a payment plan

You may be able to settle your balance in smaller instalments with a payment plan.

Speak to an advisor

Our friendly advisors will be happy to help. Just give us a call on 0330 303 0270.

We're available between 8am to 6pm (Mon-Fri).

1535 - 147001 - Document 1 of 1 - 09082023 - 5623528 - 5623815

ELIVIA
HOMES

Appendix iii

DAVID HARRIOTT

BROOMHURST LODGE, LYMINSTER ROAD, LYMINSTER
WEST SUSSEX. BN17 7QQ

Telephone: 01903 889943 harriott7qq@btinternet.com

J Bromhead, Esq.
Hill End Farm
Monk Sherborne
Tadley
Hants
RG26 5HB

24 July 2023

Dear James,

Re: Timberley Farm, Pulborough, West Sussex

I am writing to you with regard to your recent request for cattle numbers at the above farm.

I have enclosed a Continuous Herd Record for 2022 for your reference but can confirm that on average there are between 230 and 250 cattle at the farm permanently throughout the year and this number rises by about 150 extra cattle during the Summer months.

With regard to sheep numbers. This varies from 50 animals in Winter and up to 1,000 during the Summer months

The water at the farm is utilised all year round but increases extensively during the Summer.

PLease do not hesitate to contact me should you require any further information.

Kind regards

David Harriott

CONTINUOUS HERD RECORD

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
26/11/2022	253	143	3	1	162	75	88	44	23	0
27/11/2022	234	140	3	1	161	74	70	42	23	0
28/11/2022	234	140	3	1	161	74	70	42	23	0
29/11/2022	234	140	3	1	161	74	70	42	23	0
30/11/2022	234	140	3	1	160	74	71	42	23	0
01/12/2022	234	140	3	1	159	74	72	42	23	0
02/12/2022	234	140	3	1	159	73	72	43	23	0
03/12/2022	230	140	3	1	155	73	72	43	23	0
04/12/2022	246	137	3	1	171	70	72	43	23	0
05/12/2022	224	132	3	1	167	67	54	41	23	0
06/12/2022	224	132	3	1	167	67	54	41	23	0
07/12/2022	223	127	3	1	166	67	54	36	23	0
08/12/2022	208	127	3	1	151	67	54	36	23	0
09/12/2022	208	127	3	1	151	67	54	36	23	0
10/12/2022	208	127	3	1	151	66	54	37	23	0
11/12/2022	208	127	3	1	151	66	54	37	23	0
12/12/2022	208	127	3	1	151	66	54	37	23	0
13/12/2022	208	127	3	1	151	66	54	37	23	0
14/12/2022	208	127	3	1	151	66	54	37	23	0
15/12/2022	208	126	3	1	151	66	54	36	23	0
16/12/2022	208	126	3	1	150	66	55	36	23	0
17/12/2022	208	126	3	1	150	66	55	36	23	0
18/12/2022	208	126	3	1	150	66	55	36	23	0
19/12/2022	208	126	3	1	150	66	55	36	23	0
20/12/2022	208	126	3	1	150	66	55	36	23	0
21/12/2022	208	126	3	1	150	66	55	36	23	0
22/12/2022	208	126	3	1	150	66	55	36	23	0
23/12/2022	208	126	3	1	150	66	55	36	23	0
24/12/2022	208	126	3	1	150	66	55	36	23	0
25/12/2022	208	126	3	1	150	66	55	36	23	0
26/12/2022	208	126	3	1	150	65	55	37	23	0
27/12/2022	208	126	3	1	150	65	55	37	23	0
28/12/2022	208	126	3	1	150	65	55	37	23	0
29/12/2022	195	121	3	1	144	62	48	35	23	0
30/12/2022	195	121	3	1	144	62	48	35	23	0
31/12/2022	195	121	3	1	144	61	48	36	23	0

Agridata (c) Thistle Ltd 2000

CONTINUOUS HERD RECORD

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
10/10/2022	291	120	0	0	162	63	129	54	3	0
11/10/2022	291	120	0	0	161	63	130	54	3	0
12/10/2022	292	124	0	0	161	63	131	58	3	0
13/10/2022	292	124	0	0	161	63	131	58	3	0
14/10/2022	292	124	0	0	161	62	131	59	3	0
15/10/2022	292	124	0	0	161	62	131	59	3	0
16/10/2022	274	123	0	0	158	62	116	58	3	0
17/10/2022	288	146	1	0	166	67	121	74	5	0
18/10/2022	310	160	1	0	186	81	123	74	5	0
19/10/2022	310	156	1	0	186	81	123	70	5	0
20/10/2022	298	150	1	0	186	80	111	66	4	0
21/10/2022	298	150	1	0	186	80	111	66	4	0
22/10/2022	298	150	1	0	186	80	111	66	4	0
23/10/2022	298	150	1	0	186	80	111	66	4	0
24/10/2022	298	150	1	0	186	80	111	66	4	0
25/10/2022	298	150	1	0	183	80	114	66	4	0
26/10/2022	271	140	1	0	174	77	96	59	4	0
27/10/2022	270	135	1	0	174	77	95	58	0	0
28/10/2022	270	135	1	0	174	74	95	61	0	0
29/10/2022	270	135	1	0	173	74	96	61	0	0
30/10/2022	270	135	1	0	169	74	100	61	0	0
31/10/2022	270	135	1	0	169	73	100	62	0	0
01/11/2022	270	135	1	0	169	73	100	62	0	0
02/11/2022	270	135	1	0	169	72	100	63	0	0
03/11/2022	270	135	1	0	168	72	101	63	0	0
04/11/2022	270	135	1	0	168	72	101	63	0	0
05/11/2022	270	135	1	0	168	72	101	63	0	0
06/11/2022	215	100	1	0	149	57	65	43	0	0
07/11/2022	215	100	1	0	149	57	65	43	0	0
08/11/2022	233	102	1	0	155	58	77	44	0	0
09/11/2022	233	102	1	0	154	58	78	44	0	0
10/11/2022	233	102	1	0	154	58	78	44	0	0
11/11/2022	233	102	1	0	153	58	79	44	0	0
12/11/2022	233	102	1	0	153	58	79	44	0	0
13/11/2022	233	102	1	0	153	58	79	44	0	0
14/11/2022	242	136	3	1	157	68	82	49	18	0
15/11/2022	256	151	3	1	171	83	82	49	18	0
16/11/2022	256	151	3	1	169	83	84	49	18	0
17/11/2022	256	151	3	1	169	83	84	49	18	0
18/11/2022	256	151	3	1	169	83	84	49	18	0
19/11/2022	256	151	3	1	168	83	85	49	18	0
20/11/2022	253	151	3	1	168	83	82	49	18	0
21/11/2022	253	151	3	1	167	83	83	47	20	0
22/11/2022	253	151	3	1	167	83	83	44	23	0
23/11/2022	253	143	3	1	167	75	83	44	23	0
24/11/2022	253	143	3	1	163	75	87	44	23	0
25/11/2022	253	143	3	1	162	75	88	44	23	0

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
24/08/2022	284	97	0	0	177	34	107	62	1	0
25/08/2022	284	97	0	0	176	34	108	62	1	0
26/08/2022	284	97	0	0	173	33	111	63	1	0
27/08/2022	284	97	0	0	170	33	114	63	1	0
28/08/2022	284	97	0	0	170	32	114	64	1	0
29/08/2022	284	97	0	0	168	32	116	64	1	0
30/08/2022	284	97	0	0	168	31	116	65	1	0
31/08/2022	284	97	0	0	168	31	116	65	1	0
01/09/2022	284	97	0	0	168	31	116	65	1	0
02/09/2022	284	97	0	0	167	31	117	65	1	0
03/09/2022	284	97	0	0	167	31	117	65	1	0
04/09/2022	284	97	0	0	166	31	118	65	1	0
05/09/2022	284	97	0	0	165	31	119	65	1	0
06/09/2022	284	97	0	0	163	31	121	65	1	0
07/09/2022	284	97	0	0	163	31	121	65	1	0
08/09/2022	284	97	0	0	162	31	122	65	1	0
09/09/2022	284	97	0	0	162	31	122	65	1	0
10/09/2022	284	97	0	0	162	31	122	65	1	0
11/09/2022	284	97	0	0	161	31	123	65	1	0
12/09/2022	284	97	0	0	160	31	124	65	1	0
13/09/2022	284	97	0	0	160	31	124	65	1	0
14/09/2022	284	97	0	0	160	31	124	65	1	0
15/09/2022	284	97	0	0	158	31	126	65	1	0
16/09/2022	284	97	0	0	155	30	129	66	1	0
17/09/2022	284	97	0	0	153	30	131	66	1	0
18/09/2022	284	97	0	0	150	30	134	66	1	0
19/09/2022	284	97	0	0	147	30	137	66	1	0
20/09/2022	284	97	0	0	144	30	140	66	1	0
21/09/2022	284	97	0	0	141	29	143	67	1	0
22/09/2022	284	97	0	0	140	29	144	67	1	0
23/09/2022	263	82	0	0	137	29	126	52	1	0
24/09/2022	263	82	0	0	137	29	126	52	1	0
25/09/2022	258	80	0	0	134	28	124	51	1	0
26/09/2022	262	88	0	0	138	36	124	51	1	0
27/09/2022	262	88	0	0	137	36	125	51	1	0
28/09/2022	260	88	0	0	133	36	127	51	1	0
29/09/2022	240	85	0	0	132	36	108	48	1	0
30/09/2022	240	85	0	0	132	36	108	48	1	0
01/10/2022	240	85	0	0	132	36	108	48	1	0
02/10/2022	240	85	0	0	132	36	108	48	1	0
03/10/2022	286	118	0	0	160	59	126	58	1	0
04/10/2022	300	124	0	0	172	65	128	58	1	0
05/10/2022	300	126	0	0	172	65	128	60	1	0
06/10/2022	300	126	0	0	171	65	129	60	1	0
07/10/2022	300	126	0	0	170	65	130	60	1	0
08/10/2022	300	126	0	0	167	65	133	60	1	0
09/10/2022	291	120	0	0	163	64	128	55	1	0

CONTINUOUS HERD RECORD

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
08/07/2022	309	101	1	0	215	51	93	49	1	0
09/07/2022	309	101	1	0	215	49	93	51	1	0
10/07/2022	309	101	1	0	214	49	94	51	1	0
11/07/2022	309	101	1	0	213	49	95	51	1	0
12/07/2022	309	101	1	0	213	49	95	51	1	0
13/07/2022	309	101	1	0	213	49	95	51	1	0
14/07/2022	305	96	1	0	210	43	94	52	1	0
15/07/2022	305	96	1	0	210	43	94	52	1	0
16/07/2022	305	96	1	0	210	42	94	53	1	0
17/07/2022	305	96	1	0	210	42	94	53	1	0
18/07/2022	305	96	1	0	210	42	94	53	1	0
19/07/2022	304	96	1	0	208	42	95	53	1	0
20/07/2022	304	96	1	0	208	42	95	53	1	0
21/07/2022	304	96	1	0	208	42	95	53	1	0
22/07/2022	304	96	1	0	207	42	96	53	1	0
23/07/2022	304	96	1	0	207	42	96	53	1	0
24/07/2022	304	96	1	0	207	42	96	53	1	0
25/07/2022	303	96	1	0	207	41	95	54	1	0
26/07/2022	303	96	1	0	207	41	95	54	1	0
27/07/2022	303	96	1	0	206	39	96	56	1	0
28/07/2022	303	96	1	0	205	39	97	56	1	0
29/07/2022	303	96	1	0	205	39	97	56	1	0
30/07/2022	303	96	1	0	204	38	98	57	1	0
31/07/2022	303	96	1	0	204	38	98	57	1	0
01/08/2022	303	96	1	0	204	38	98	57	1	0
02/08/2022	303	96	1	0	204	38	98	57	1	0
03/08/2022	303	96	1	0	204	38	98	57	1	0
04/08/2022	303	96	0	0	204	38	99	57	1	0
05/08/2022	303	96	0	0	203	38	100	57	1	0
06/08/2022	303	96	0	0	202	37	101	58	1	0
07/08/2022	303	96	0	0	202	37	101	58	1	0
08/08/2022	309	98	0	0	207	39	102	58	1	0
09/08/2022	309	98	0	0	206	38	103	59	1	0
10/08/2022	303	98	0	0	203	38	100	59	1	0
11/08/2022	303	98	0	0	203	38	100	59	1	0
12/08/2022	303	98	0	0	203	38	100	59	1	0
13/08/2022	303	98	0	0	203	37	100	60	1	0
14/08/2022	303	98	0	0	203	37	100	60	1	0
15/08/2022	303	98	0	0	203	37	100	60	1	0
16/08/2022	303	98	0	0	202	37	101	60	1	0
17/08/2022	303	98	0	0	200	37	103	60	1	0
18/08/2022	301	98	0	0	199	37	102	60	1	0
19/08/2022	301	98	0	0	195	37	106	60	1	0
20/08/2022	301	98	0	0	195	37	106	60	1	0
21/08/2022	284	97	0	0	179	35	105	61	1	0
22/08/2022	284	97	0	0	179	35	105	61	1	0
23/08/2022	284	97	0	0	177	34	107	62	1	0

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
22/05/2022	285	85	1	0	242	71	42	13	1	0
23/05/2022	285	85	1	0	242	70	42	14	1	0
24/05/2022	289	90	1	0	244	72	44	17	1	0
25/05/2022	289	99	1	0	243	74	45	24	1	0
26/05/2022	289	99	1	0	242	74	46	24	1	0
27/05/2022	289	99	1	0	242	73	46	25	1	0
28/05/2022	289	99	1	0	242	72	46	26	1	0
29/05/2022	289	99	1	0	241	71	47	27	1	0
30/05/2022	287	99	1	0	239	71	47	27	1	0
31/05/2022	290	99	1	0	239	71	50	27	1	0
01/06/2022	290	99	1	0	239	71	50	27	1	0
02/06/2022	290	99	1	0	239	69	50	29	1	0
03/06/2022	290	99	1	0	239	69	50	29	1	0
04/06/2022	290	99	1	0	239	69	50	29	1	0
05/06/2022	*290*	*99*	*1*	*0*	*239*	*68*	*50*	*30*	*1*	*0*
06/06/2022	290	99	1	0	239	68	50	30	1	0
07/06/2022	306	99	1	0	239	68	66	30	1	0
08/06/2022	306	99	1	0	238	67	67	31	1	0
09/06/2022	302	99	1	0	235	65	66	33	1	0
10/06/2022	302	99	1	0	234	65	67	33	1	0
11/06/2022	302	99	1	0	233	65	68	33	1	0
12/06/2022	293	98	1	0	225	65	67	32	1	0
13/06/2022	293	98	1	0	225	65	67	32	1	0
14/06/2022	293	98	1	0	225	65	67	32	1	0
15/06/2022	293	95	1	0	225	63	67	31	1	0
16/06/2022	293	95	1	0	224	63	68	31	1	0
17/06/2022	293	95	1	0	224	62	68	32	1	0
18/06/2022	293	95	1	0	224	61	68	33	1	0
19/06/2022	293	95	1	0	223	60	69	34	1	0
20/06/2022	290	95	1	0	220	60	69	34	1	0
21/06/2022	286	104	1	0	215	60	70	43	1	0
22/06/2022	286	104	1	0	214	60	71	43	1	0
23/06/2022	286	104	1	0	214	59	71	44	1	0
24/06/2022	286	104	1	0	213	56	72	47	1	0
25/06/2022	286	104	1	0	213	56	72	47	1	0
26/06/2022	286	104	1	0	213	55	72	48	1	0
27/06/2022	286	104	1	0	212	55	73	48	1	0
28/06/2022	297	104	1	0	219	54	77	49	1	0
29/06/2022	297	104	1	0	218	54	78	49	1	0
30/06/2022	297	104	1	0	217	54	79	49	1	0
01/07/2022	297	104	1	0	217	53	79	50	1	0
02/07/2022	297	104	1	0	217	53	79	50	1	0
03/07/2022	297	104	1	0	216	53	80	50	1	0
04/07/2022	297	103	1	0	215	53	81	49	1	0
05/07/2022	309	103	1	0	215	52	93	50	1	0
06/07/2022	309	101	1	0	215	51	93	49	1	0
07/07/2022	309	101	1	0	215	51	93	49	1	0

CONTINUOUS HERD RECORD

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
05/04/2022	231	49	1	0	196	41	34	5	3	0
06/04/2022	231	49	1	0	196	41	34	5	3	0
07/04/2022	231	49	1	0	195	41	35	5	3	0
08/04/2022	231	49	1	0	194	41	36	5	3	0
09/04/2022	231	49	1	0	194	40	36	6	3	0
10/04/2022	231	49	1	0	193	40	37	6	3	0
11/04/2022	231	49	1	0	193	40	37	6	3	0
12/04/2022	231	49	1	0	193	40	37	6	3	0
13/04/2022	231	49	1	0	192	40	38	6	3	0
14/04/2022	231	48	1	0	192	40	38	5	3	0
15/04/2022	231	48	1	0	191	40	39	5	3	0
16/04/2022	231	48	1	0	190	40	40	5	3	0
17/04/2022	231	48	1	0	190	40	40	5	3	0
18/04/2022	214	36	1	0	181	30	32	3	3	0
19/04/2022	214	36	1	0	180	30	33	3	3	0
20/04/2022	214	36	1	0	180	30	33	3	3	0
21/04/2022	214	36	1	0	179	30	34	3	3	0
22/04/2022	214	36	1	0	179	30	34	3	3	0
23/04/2022	214	36	1	0	179	30	34	3	3	0
24/04/2022	239	47	1	0	197	39	41	5	3	0
25/04/2022	239	47	1	0	197	39	41	5	3	0
26/04/2022	250	54	1	0	208	42	41	9	3	0
27/04/2022	250	54	1	0	208	42	41	9	3	0
28/04/2022	234	52	1	0	201	39	32	10	3	0
29/04/2022	241	60	1	0	208	47	32	10	3	0
30/04/2022	241	60	1	0	208	47	32	10	3	0
01/05/2022	241	60	1	0	208	47	32	10	3	0
02/05/2022	241	60	1	0	206	47	34	10	3	0
03/05/2022	254	63	1	0	215	49	38	11	3	0
04/05/2022	254	63	1	0	215	49	38	11	3	0
05/05/2022	254	61	1	0	215	48	38	10	3	0
06/05/2022	254	61	1	0	215	48	38	10	3	0
07/05/2022	253	61	1	0	214	47	38	11	3	0
08/05/2022	237	58	1	0	206	46	30	9	3	0
09/05/2022	233	59	1	0	209	48	23	9	2	0
10/05/2022	268	71	1	0	239	60	28	9	2	0
11/05/2022	267	69	1	0	238	59	28	9	1	0
12/05/2022	267	69	1	0	238	58	28	10	1	0
13/05/2022	267	69	1	0	237	58	29	10	1	0
14/05/2022	267	69	1	0	237	58	29	10	1	0
15/05/2022	267	69	1	0	236	57	30	11	1	0
16/05/2022	267	69	1	0	236	56	30	12	1	0
17/05/2022	267	69	1	0	236	56	30	12	1	0
18/05/2022	267	69	1	0	235	56	31	12	1	0
19/05/2022	262	69	1	0	227	56	34	12	1	0
20/05/2022	285	85	1	0	245	71	39	13	1	0
21/05/2022	285	85	1	0	242	71	42	13	1	0

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
17/02/2022	196	37	0	0	160	32	36	2	3	0
18/02/2022	196	37	0	0	160	32	36	2	3	0
19/02/2022	196	37	0	0	160	32	36	2	3	0
20/02/2022	196	37	0	0	160	32	36	2	3	0
21/02/2022	196	37	0	0	159	32	37	2	3	0
22/02/2022	196	37	0	0	159	32	37	2	3	0
23/02/2022	196	37	0	0	159	32	37	2	3	0
24/02/2022	196	37	0	0	159	32	37	2	3	0
25/02/2022	196	37	0	0	158	32	38	2	3	0
26/02/2022	196	37	0	0	158	32	38	2	3	0
27/02/2022	196	37	0	0	158	32	38	2	3	0
28/02/2022	211	42	0	0	173	37	38	2	3	0
01/03/2022	215	42	0	0	176	37	39	2	3	0
02/03/2022	215	42	0	0	176	37	39	2	3	0
03/03/2022	215	42	0	0	176	37	39	2	3	0
04/03/2022	215	42	0	0	176	37	39	2	3	0
05/03/2022	215	42	0	0	171	37	44	2	3	0
06/03/2022	215	42	0	0	171	37	44	2	3	0
07/03/2022	215	42	0	0	168	36	47	3	3	0
08/03/2022	224	45	0	0	176	39	48	3	3	0
09/03/2022	224	45	0	0	176	39	48	3	3	0
10/03/2022	199	44	0	0	162	38	37	3	3	0
11/03/2022	199	44	0	0	162	38	37	3	3	0
12/03/2022	199	44	0	0	162	38	37	3	3	0
13/03/2022	187	40	0	0	152	34	35	3	3	0
14/03/2022	198	51	1	0	165	44	32	3	4	0
15/03/2022	199	51	1	0	164	44	34	3	4	0
16/03/2022	197	47	1	0	162	43	34	1	3	0
17/03/2022	188	47	1	0	160	43	27	1	3	0
18/03/2022	188	47	1	0	159	43	28	1	3	0
19/03/2022	188	47	1	0	159	43	28	1	3	0
20/03/2022	188	47	1	0	159	43	28	1	3	0
21/03/2022	188	47	1	0	158	42	29	2	3	0
22/03/2022	218	47	1	0	188	42	29	2	3	0
23/03/2022	218	47	1	0	187	42	30	2	3	0
24/03/2022	218	47	1	0	186	42	31	2	3	0
25/03/2022	218	47	1	0	186	42	31	2	3	0
26/03/2022	218	47	1	0	186	42	31	2	3	0
27/03/2022	218	47	1	0	185	42	32	2	3	0
28/03/2022	233	49	1	0	198	44	34	2	3	0
29/03/2022	233	49	1	0	198	44	34	2	3	0
30/03/2022	231	49	1	0	198	43	32	3	3	0
31/03/2022	231	49	1	0	198	43	32	3	3	0
01/04/2022	231	49	1	0	197	43	33	3	3	0
02/04/2022	231	49	1	0	197	43	33	3	3	0
03/04/2022	231	49	1	0	197	43	33	3	3	0
04/04/2022	231	49	1	0	196	42	34	4	3	0

CONTINUOUS HERD RECORD

Date (a)	TOTAL CATTLE		Calves under 6 months		All male cattle and heifers at least 6 months old but less than 24 months old		Suckler and dairy cows and all male cattle and heifers at least 24 months old			
	Males (b)	Females (c)	Males (d)	Females (e)	Males (f)	Heifers (g)	Males (h)	Heifers (i)	Sucklers (j)	Dairy (k)
01/01/2022	275	64	0	0	236	49	39	14	1	0
02/01/2022	275	64	0	0	235	49	40	14	1	0
03/01/2022	275	64	0	0	235	49	40	14	1	0
04/01/2022	280	64	0	0	240	49	40	14	1	0
05/01/2022	280	61	0	0	240	46	40	14	1	0
06/01/2022	280	61	0	0	240	46	40	14	1	0
07/01/2022	280	61	0	0	240	46	40	14	1	0
08/01/2022	280	61	0	0	240	46	40	14	1	0
09/01/2022	280	61	0	0	240	46	40	14	1	0
10/01/2022	280	61	0	0	239	45	41	15	1	0
11/01/2022	289	61	0	0	248	45	41	15	1	0
12/01/2022	292	61	0	0	251	45	41	15	1	0
13/01/2022	292	61	0	0	251	45	41	15	1	0
14/01/2022	292	61	0	0	251	45	41	15	1	0
15/01/2022	292	61	0	0	251	45	41	15	1	0
16/01/2022	280	51	0	0	239	40	41	10	1	0
17/01/2022	279	51	0	0	237	40	42	10	1	0
18/01/2022	279	51	0	0	237	40	42	10	1	0
19/01/2022	278	51	0	0	236	40	42	10	1	0
20/01/2022	278	51	0	0	236	40	42	10	1	0
21/01/2022	278	51	0	0	236	39	42	11	1	0
22/01/2022	278	51	0	0	235	39	43	11	1	0
23/01/2022	278	51	0	0	233	39	45	11	1	0
24/01/2022	278	51	0	0	233	39	45	11	1	0
25/01/2022	278	51	0	0	233	39	45	11	1	0
26/01/2022	278	51	0	0	233	39	45	11	1	0
27/01/2022	277	47	0	0	233	38	44	8	1	0
28/01/2022	216	47	0	0	173	38	43	8	1	0
29/01/2022	216	47	0	0	173	38	43	8	1	0
30/01/2022	216	47	0	0	172	38	44	8	1	0
31/01/2022	216	47	0	0	172	38	44	8	1	0
01/02/2022	216	47	0	0	172	38	44	8	1	0
02/02/2022	216	47	0	0	172	38	44	8	1	0
03/02/2022	216	47	0	0	172	38	44	8	1	0
04/02/2022	210	45	0	0	172	38	38	6	1	0
05/02/2022	210	45	0	0	172	38	38	6	1	0
06/02/2022	210	45	0	0	172	38	38	6	1	0
07/02/2022	210	45	0	0	172	38	38	4	3	0
08/02/2022	210	45	0	0	170	38	40	4	3	0
09/02/2022	210	45	0	0	170	37	40	5	3	0
10/02/2022	210	45	0	0	170	37	40	5	3	0
11/02/2022	210	45	0	0	169	37	41	5	3	0
12/02/2022	210	45	0	0	168	37	42	5	3	0
13/02/2022	197	41	0	0	162	34	35	4	3	0
14/02/2022	197	41	0	0	162	34	35	4	3	0
15/02/2022	197	41	0	0	162	34	35	4	3	0
16/02/2022	197	41	0	0	160	34	37	4	3	0

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Appendix iv

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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

ELIVIA HOMES

WATER NEUTRALITY

HYDROGEOLOGICAL CONCEPTUAL SITE MODEL REPORT

DECEMBER 2023

wardell armstrong

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ELIVIA HOMES

WATER NEUTRALITY

HYDROGEOLOGICAL CONCEPTUAL SITE MODEL REPORT

DECEMBER 2023

PREPARED BY:

Neil Buchanan Senior Hydrogeologist

REVIEWED BY:

Craig Speed Technical Director

APPROVED BY:

Craig Speed Technical Director

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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

CONTENTS

APPENDICES

DRAWINGS	**TITLE**
ST20485-001	Area of Interest
ST20485-002	HCSM (Geological Map and Cross-section)
ST20485-003	Radius of Influence

1 INTRODUCTION

1.1 Purpose

1.1.1 Wardell Armstrong LLP has been contracted by Elivia Homes ("the Client"; formerly known as Millwood Designer Homes) to provide this Hydrogeological Conceptual Site Model (HCSM) report, comprising the Part 1 deliverable of a two-part project outlined in proposal CS/ST20485/0001, dated 19 July 2023[1].

1.1.2 It should be noted that proposal CS/ST20485/0001 was based upon the geology of the abstraction well at Timberley Farm reported erroneously on the British Geological Survey (BGS) website as Upper Greensand Formation (see Section 1.5.1 for further information).

1.1.3 The purpose of this report is to assess whether groundwater abstraction from the abstraction well at Timberley Farm will result in groundwater drawdown that impacts water levels in Sites of Special Scientific Interest (SSSI).

1.2 Background

1.2.1 The Client has produced housing development plans for a number of locations in Horsham District and Chichester District, West Sussex County. The housing developments would require a mains water supply from the Sussex North Water Resource Zone (**Drawing ST20485-001**), which is managed by Southern Water.

1.2.2 Natural England believes that on-going abstraction of groundwater from the Sussex North Water Resource Zone, which takes place at Southern Water's Public Water Supply abstraction site in Hardham, in Horsham District, may be having a detrimental effect on SSSIs in the Arun Valley, including those designated as a Special Protection Area (SPA), a Special Area of Conservation (SAC) and a Ramsar site. This belief is based on current evidence being inconclusive that on-going abstraction of groundwater from the Sussex North Water Resource Zone is *not* having a detrimental effect[2].

1.2.3 Natural England has therefore advised Horsham District Council and Chichester District Council through position statements[2] that any new housing developments that would require water supply from the Sussex North Water Resource Zone must

[1] Delivery of Part 2 of this project, a pumping test report, had not been instructed at the time of writing as this will be dependent upon the findings of this HCSM report.

[2] Horsham District Council, 2023. *Water neutrality: Position statement and response*. Online: https://www.horsham.gov.uk/planning/water-neutrality-in-horsham-district/position-statement [accessed November 2023]. Three position statements available: (i) September 2021; (ii) February 2022; and (iii) November 2022.

demonstrate *water neutrality* through submission of a Water Neutrality Statement, detailing the existing and proposed water supply demands and how water neutrality will be achieved.

1.2.4 The definition of water neutrality used by Natural England is that of Therivel et al.[3], which states: *"For every new development, total water use in the region after the development must be equal to or less than the total water use in the region before the new development."* The "region" referred to by Natural England in this definition is the Sussex North Water Resource Zone (further information on which is provided in Section 1.3).

1.2.5 Water neutrality can be achieved through a combination of water efficiency measures (which would reduce the water supply demand to a minimum) and offsetting (which would neutralise any remaining excess in water supply demand in the water resource zone).

1.3 Sussex North Water Resource Zone

1.3.1 Water companies in England and Wales, including Southern Water, prepare and maintain a Water Resources Management Plan (WRMP). A WRMP sets out how a water company intends to achieve a sustainable water resource for its customers and the environment over at least 25 years. It is prepared at least every five years and reviewed annually.[4]

1.3.2 A WRMP is based on assessments undertaken on water resource zones. A water resource zone, such as the Sussex North Water Resource Zone, is defined as *"an area within which the sources of water and distribution of water to meet demand is largely self-contained (apart from any agreed bulk transfers)"*[4].

1.3.3 The Sussex North Water Resource Zone covers all of Horsham District and approximately half of Chichester District (as well as parts of neighbouring Arun District and Crawley District). This coverage includes the locations of the proposed housing developments, Southern Water's site (Hardham, in Horsham District), the abstraction well at Timberley Farm (Chichester District) and – particularly pertinent to this HCSM

[3] Therivel, R., Drury, C. and Hepburn, I., 2006. *Achieving Water Neutrality in the South East Region*. Discussion Paper. Oct. 2006.

[4] UK Government, 14 April 2023. *Water resources planning guideline*. Online: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline [accessed November 2023].

report – the Lower Greensand Arun & Western Streams water body, and SSSIs in the Arun Valley, including those designated as an SPA, an SAC and a Ramsar site.

1.3.4 The Lower Greensand Arun & Western Streams water body refers to the area where the Lower Greensand Group outcrops. Southern Water's site is within the delineation of the water body while the abstraction well at Timberley Farm is outside it. However, the abstraction well is screened in the Lower Greensand Group (specifically the Folkestone Formation), albeit outside the delineation of the water body and where the Lower Greensand Group is below the Gault Formation rather than outcropping.

1.4 Offsetting using the Abstraction Well at Timberley Farm

1.4.1 The Client has already proposed the incorporation of water efficiency measures into its housing development plans. The Client intends to propose the incorporation of offsetting through the use of the abstraction well at Timberley Farm. The farm's water demands are currently wholly met through the mains water supply. However, by using an abstraction well to meet part of the farm's water demands (for the supply of water for its beef cattle), the water from the mains water supply that would otherwise have been used by the farm will be available for use by the housing developments.

1.4.2 The abstraction well at Timberley Farm is located at approximate National Grid Reference (NGR) TQ 02061 14232, in Chichester District and near the town of Bury. The well was constructed on 27 November 2022 and a pump was installed on 22 June 2023. The abstraction well is not currently in operation, and it is understood that it has never been operated (with the exception of operation during any equipment checks).

1.4.3 The landowner of Timberley Farm has stated to the Client that he is offering to offset approximately 5.5 million litres per year (5,500 m^3/year) from the mains water supply using groundwater from the abstraction well. The landowner has also stated to the Client that the abstraction well has been "…*proven to circa 7 million litres…*"[5] (7,000 m^3/year or approximately 19 m^3/day), which equates approximately to the daily maximum volume of groundwater that can be abstracted without a licence from the Environment Agency.

[5] Email correspondence between Emma Challenger (Head of Strategic Land, Elivia Homes) and James Bromhead (Landowner, Timberley Farm), 20 November 2023.

1.5 Abstraction Well at Timberley Farm

1.5.1 The abstraction well is located within the main farmyard area of Timberley Farm. Photographs showing the location of the abstraction well, the water tank and providing detailed views of the abstraction headworks are provided in **Appendix 1**.

1.5.2 The record of the geological log of the abstraction well held by the BGS[6] (BGS ID 21360821 BGS; Reference: TQ01SW46) states at the time of writing that the abstraction well at Timberley Farm is screened in the Upper Greensand Formation. However, it is understood based on correspondence[7] between the Client and Nicholls Boreholes & Ground Source, who is responsible for the geological log of the abstraction well, that the record held by the BGS is erroneous: the abstraction well at Timberley Farm is screened in the Folkestone Formation of the Lower Greensand Group.

1.5.3 The *WR38 Borehole Record Form* provided to the Client by Nicholls Boreholes & Ground Source, which includes the correct version of the geological log and the construction log, is presented in **Appendix 2**. The abstraction well is screened from 50 to 74 m below ground level (mbgl), within the Folkestone Formation, which was encountered during drilling from 29 mbgl to the end of the borehole at 77 mbgl. The pump intake is at 40 mbgl, and is set up to route abstracted groundwater to a 20,000 litre capacity storage tank at surface.

1.5.4 A *Pump & Filtration Installation Record* provided to the Client by the landowner of Timberley Farm, which includes the model of pump (knowledge of which allows further detail to be obtained from the manufacturer's website), is presented in **Appendix 3**.

[6] British Geological Survey (BGS), 2020. *GeoIndex (onshore)*. Online: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [accessed November 2023].
[7] Email correspondence between Emma Challenger (Head of Strategic Land, Elivia Homes) and Simon Parsons (Senior Project Manager, Nicholls Boreholes & Ground Source), 20 November 2023.

2 THE WATER ENVIRONMENT

2.1 Area of Interest ("the Area")

2.1.1 For the purpose of describing the environment of the abstraction well at Timberley Farm that is appropriate (i.e., not too large or too small, and including features of significance), an "area of interest" ("the Area") has been selected.

2.1.2 The Area equates approximately to a rectangular geometrical area of approximately 35 km^2, with the abstraction well at Timberley Farm in its south-east corner (**Drawing ST20485-001**). This was selected because it encompasses both an estimated radius of influence of the abstraction well when operational, the Lower Greensand Arun & Western Streams water body that is in the vicinity of the well, and relevant SSSIs in the Arun Valley.

2.2 Setting

2.2.1 The Area is located approximately in the centre of the South Downs National Park. The railway track of the Arun Valley Line runs from north to south, approximately bisecting the Area. The A29 (variably named Bury Hill, Bury Road, Beacon Hill and London Road) runs from approximately north to south, approximately parallel to the Arun Valley Line. The B2139 (variably named Turnpike Road and Amberley Road) runs from the south of the A29 to the east.

2.2.2 The topography of the Area varies from relatively hilly terrain in the south, with elevations up to approximately 180 m above ordnance datum (mAOD), to relatively flat terrain in the centre and north, with elevations of approximately 5 mAOD.

2.2.3 The relatively hilly terrain comprises mixed wood and pasture through which the South Downs Way runs, and notably the Duncton to Bignor Escarpment in the west (just outside the Area), which is a SAC approximately 2.8 km from the abstraction well, awarded this designation primarily due to its beech forests. The relatively flat terrain comprises non-coniferous and mixed wood, and farmland, including the farmland of Timberley Farm.

2.2.4 The River Arun flows meandering from north to south, approximately parallel to the Arun Valley Line, and at one point crosses under the Arun Valley Line approximately 500 m south of Timberley Farm as it migrates from the east to the west of the railway track. The River Rother, a tributary to the River Arun, flows from west to east in the north of the Area.

2.2.5 On the east of the Arun Valley Line and adjacent to the River Arun are three nature reserves: the Amberley Wild Brooks Nature Reserve, an SPA, SAC and Ramsar site approximately 370 m east of the abstraction well; the Waltham Brooks Nature Reserve, an SPA and Ramsar site approximately 1.3 km north-east of the abstraction well; and the Pulborough Brooks Nature Reserve, an SPA, SAC and Ramsar site approximately 3.0 km north-east of the abstraction well.

2.3 Hydrology

2.3.1 The Area is within the Arun and Western Streams catchment, which has been selected as a priority catchment by the Department for Environment, Food & Rural Affairs (DEFRA). Priority catchments are those where DEFRA has identified an "*unmet demand for water and the potential to use innovative licensing approaches to help meet that demand*"[8]. A total of four priority catchments were selected and, since 2018, these priority catchments have been subject to a pilot study employing various licensing approaches. Pertinent to this HCSM report, these licensing approaches are expected to include the introduction of "*controls on more licences to better protect the environment, particularly at low flows*" and "*fine tuning the use of surface water and groundwater sources to make the best use of water when it is available while protecting the environment*"[8].

2.3.2 The Area comprises a mixture of natural surface water features, such as rivers and wetlands, and man-made surface water features, such as drainage ditches and lakes. Notable surface water features are listed in Table 1.

Table 1 – Notable surface water features within the area of interest

Approximate Distance from Abstraction Well (km)	Name	Designation	Approximate Area (km²)	Management	Description
0.33	River Arun	Main River	-	Environment Agency.	Flows meandering from north to south through the middle of the area of interest. Fed by springs to the east of Horsham. Characterised by high peak flows but low summer flows.*

[8] Department for Environment, Food & Rural Affairs (DEFRA), 27 July 2021. *Water abstraction plan*. Online: https://www.gov.uk/government/publications/water-abstraction-plan-2017/water-abstraction-plan [accessed November 2023].

Table 1 – Notable surface water features within the area of interest

Approximate Distance from Abstraction Well (km)	Name	Designation	Approximate Area (km²)	Management	Description
0.37	Amberley Wild Brooks Nature Reserve	SPA SAC Ramsar	0.80	Sussex Wildlife Trust.	Grazing marsh and ditches in a floodplain landscape important for rare birds, insects and plants.
1.30	Waltham Brooks Nature Reserve	SPA Ramsar	0.42	Sussex Wildlife Trust.	Grazing marsh with a large open water area important for birds.
1.70	Mill Farm Fishery	None	0.03	Fisheries.	Three man-made lakes created for fishing.
3.00	Pulborough Brooks Nature Reserve	SPA SAC Ramsar	1.65	Royal Society for the Protection of Birds (RSPB).	Meadows, pools and heathland.
3.30	River Rother	Main River	-	Environment Agency.	Tributary to River Arun. Flows from west to east. Fed by groundwater of the Lower Greensand Group and the Chalk Group (the latter from springs). Because of the groundwater source, the River Rother has higher summer flows than the River Arun. Winter flows can be high following rainfall.*

Note
"Approximate distance from abstraction well" is measured to the nearest point of the surface water feature.
SPA = Special Protection Area
SAC = Special Area of Conservation
"Area of interest" refers to the area approximately within a 5 km radius of the abstraction well at Timberley Farm (National Grid Reference TQ 02061 14232).

* Environment Agency, 22 June 2022. *Arun and Western Streams abstraction licensing strategy (ALS)*. Online: https://www.gov.uk/government/publications/arun-and-western-streams-abstraction-licensing-strategy/arun-and-western-streams-abstraction-licensing-strategy-als [accessed November 2023].

2.3.3 Rainfall records have been obtained from a tipping bucket rain gauge (station ID 319026) located in Hardham at NGR TQ 03387 17727[9], approximately 3.7 km north-north-east of the abstraction well. Mean monthly rainfall has been calculated based on 1999-2023 records, omitting any records that were not listed as *complete*, and is

[9] Department for Environment, Food & Rural Affairs (DEFRA), 2021. *Hydrology Data Explorer*. Online: https://environment.data.gov.uk/hydrology/explore#/landing [accessed November 2023].

presented in Table 2. The pattern and intensity of mean monthly rainfall appear to be normal for Southern England[10].

Table 2 – Mean monthly rainfall from Hardham tipping bucket rain gauge (Station ID 319026)

Month	Mean monthly rainfall (mm)
January	103.4
February	68.3
March	55.0
April	48.2
May	52.4
June	62.3
July	50.6
August	66.9
September	60.7
October	112.0
November	102.2
December	116.0

Note: mean monthly rainfall has been calculated from 1999-2023 data, omitting any records that were not listed as *complete*.

Source: Department for Environment, Food & Rural Affairs (DEFRA), 2021. *Hydrology Data Explorer*. Online: https://environment.data.gov.uk/hydrology/explore#/landing [accessed November 2023]

2.4 Geology

2.4.1 The Area lies within the Weald Basin. The Weald Basin has been subject firstly to uplift (forming an anticlinal structure known as the Wealden Anticline) and secondly to erosion (exposing the relatively old strata in the middle of the Wealden Anticline, with progressively younger strata exposed towards the outside of the anticline, e.g., to the south). Smaller-scale folds, also known as parasitic folds, appear to have formed in the southern limb of the Wealden Anticline in the vicinity of the abstraction well at Timberley Farm.

[10] Met Office, October 2016. *Southern England: climate*. Online: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/southern-england_-climate---met-office.pdf [accessed November 2023].

Regional Geology

2.4.2 The superficial geology of the Weald Basin comprises Alluvium and River Terrace Deposits – these are found within and adjacent to the riverbeds of the River Arun and the River Rother – Peat – this is found adjacent to the riverbed of the River Arun, notably in Waltham Brooks Nature Reserve, Amberly Wild Brooks Nature Reserve and Pulborough Brooks Nature Reserve – and Head – this is found throughout the Weald Basin.

2.4.3 The BGS[11,13] describes the superficial geology as follows.

- Alluvium: "*…a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope. Synonym: alluvial deposits. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present*."
- River Terrace Deposits: "*River terrace gravels, sands and associated organic sediments.*" The River Terrace Deposits found in the Arun Valley may be referred to specifically as the "Arun Formation" or "Arun Terrace Deposits", and are categorised into seven aggradations. Average (mean) thickness is 4 m and maximum thickness is 10 m.
- Peat: "*…a partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps*."
- Head: "*…poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes. Solifluction is the slow viscous downslope flow of waterlogged soil and other unsorted and unsaturated superficial deposits. The term gelifluction is restricted to the slow flow of fluidized superficial deposits during the thawing of seasonally frozen ground. The flow is initiated by meltwater from thawing ice lenses."*

[11] British Geological Survey (BGS), 2023. *BGS Geology Viewer*. Online: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ [accessed November 2023].

2.4.4 The regional bedrock geology of the Weald Basin, based on BGS records[12,13], is presented in Table 3.

Table 3 – Regional bedrock geology of the Weald Basin

Age	Name		Description	Thickness
Upper Cretaceous (100.5-66.0 Ma)	Chalk Group	Upper Chalk	Chalk, with or without flint and discrete limestone, marl (calcareous mudstone), sponge, calcarenite, phosphatic, hardground and fossil-rich beds. Upper Cretaceous, Cenomanian [100.5-93.9 Ma] to Maastrichtian [72.1-66.0 Ma].	Up to 560 m
		Middle Chalk		
		Lower Chalk		
Lower Cretaceous (145.0-100.5 Ma)	Upper Greensand Formation		Sand and sandstone, fine-grained, silt, glauconitic, shelly.	Up to 75 m
	Gault Formation		Pale to dark grey or blue-grey clay or mudstone, glauconitic in part, with a sandy base. Discrete bands of phosphatic nodules (commonly preserving fossils), some pyrite and calcareous nodules... . In places thin, variable junction beds at the base include some limestones.	Up to 110 m
	Lower Greensand Group	Folkestone Formation	**Lower Greensand Group:** Mainly sands and sandstones (varying from well-sorted fine-grained to poorly sorted medium- to coarse-grained) with silts and clays in some intervals. **Folkestone Formation:** ...medium- and coarse-grained, well-sorted cross-bedded sands and weakly cemented sandstones... .	**Lower Greensand Group:** up to 250 m **Folkestone Formation:** up to 80 m
		Sandgate Formation		
		Hythe Formation		
		Atherfield Clay Formation		
	Weald Clay Formation		Dark grey thinly-bedded mudstones (shales) and mudstones with subordinate siltstones, fine- to medium-grained sandstones, including calcareous sandstone (e.g., Horsham Stone Member), shelly limestones (the so called "Paludina Limestones") and clay ironstones.	Up to 460 m

Note: Ma = megaannum (or "million years ago")

Source of age and name: British Geological Survey (BGS), 1996. *Chichester and Bognor. England and Wales. Sheet 317/332. Solid and Drift Geology. 1:50,000.* Online: https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001807 [accessed November 2023].
Source of description and thickness: British Geological Survey (BGS), 2023. *BGS Lexicon of Named Rocked Units*. Online: https://www.bgs.ac.uk/technologies/the-bgs-lexicon-of-named-rock-units/ [accessed November 2023].

[12] British Geological Survey (BGS), 1996. *Chichester and Bognor. England and Wales. Sheet 317/332. Solid and Drift Geology. 1:50,000*. Online: https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001807 [accessed November 2023].
[13] British Geological Survey (BGS), 2023. *BGS Lexicon of Named Rocked Units*. Online: https://www.bgs.ac.uk/technologies/the-bgs-lexicon-of-named-rock-units/ [accessed November 2023].

Local Geology

2.4.5 The geology local to the abstraction well at Timberley Farm, based on BGS records of the geological log for the abstraction well at Timberley Farm (bearing in mind the amendment stated in Sections 1.1.2 and 1.5.1 of this HCSM report) and for those of three neighbouring boreholes[6] that were drilled into the Folkestone Formation, is presented in Table 4.

Table 4 – Geology local to the abstraction well at Timberley Farm

			Name	Abstraction well at Timberley Farm BGS ID 21360821 BGS Reference: TQ01SW46				Name unknown BGS ID: 570329 BGS Reference: TQ01SW10				Name unknown BGS ID: 570334 BGS Reference: TQ01SW15				Hardham BH062 BGS ID: 570051 BGS Reference: TQ01NW19			
			Drilled mbgl or mAOD	Mbgl		mAOD		mbgl		mAOD		mbgl		mAOD		mbgl		mAOD	
				From	To	From	To	From	To	From	To	From	To	From	To	From	To	From	To
Geology (interpreted where not stated)	Top soil			0.0	1.0	17.4	16.4	0.0	n/a	7.0	n/a	0.0	n/a	6.4	n/a	0.0	n/a	13.0	n/a
	Alluvium or River Terrace Deposits			1.0	5.0	16.4	12.4	n/a	22.3	n/a	-15.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Gault Formation			5.0	48.0	12.4	-30.6	22.3	55.6*	-15.3	-48.6*	n/a	50.6	n/a	-44.2	6.0	36.0	7.0	-23.0
	Lower Greensand Group	Folkestone Formation		48.0	77.0	-30.6	-59.6	n/a	n/a	n/a	n/a	50.6	53.6	-44.2	-47.2	36.0	91.0	-23.0	-78.0
		Sandgate Formation		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	91.0	93.0	-78.0	-80.0
Ground elevation (mAOD)				17.4				7.0				6.4				13.0			
National Grid Reference				TQ 02061 14232				TQ 01590 14160				TQ 01000 14440				TQ 00920 15050			
Approximate distance from abstraction well at Timberley Farm (km)				-				0.5				1.1				1.4			

Note
BGS = British Geological Survey
mbgl = metres below ground level
mAOD = metres above ordnance datum
n/a = not available
The ground elevation of the abstraction well at Timberley Farm (17.4 mAOD) was not provided in the geological log; it has been estimated using OS (Ordnance Survey) Maps online.
The geology stated as "Upper Greensand Formation" in the geological log for the abstraction well at Timberley Farm was amended to "Folkestone Formation", as discussed in Sections 1.1.2 and 1.5.1 of this HCSM report.
* The geological log states that the Folkestone Formation may have been "touched" (i.e., the end of the borehole may have been at the top of the Folkestone Formation) and that there was a "plentiful supply" of water at the bottom of the borehole (i.e., as the bottom of the borehole at -48.6 mAOD was being reached) that was "probably from the Lower Greensand" Group.

Source: unless otherwise stated, the source of the data is: British Geological Survey (BGS), 2023. *GeoIndex (onshore)*. Online: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [accessed November 2023].

2.5 Hydrogeology

2.5.1 The abstraction well at Timberley Farm is screened in the Folkestone Formation and therefore this stratum will be the focus of this section.

Aquifer designations

2.5.2 The superficial geology is designated *Secondary A* and *Secondary (undifferentiated)* aquifers. These are defined by the Environment Agency[14] as follows.

- *Secondary A* aquifer: an aquifer that comprises "*…permeable layers that can support local water supplies, and may form an important source of base flow to rivers.*"
- *Secondary (undifferentiated)* aquifer: an aquifer *"…where it is not possible to apply either a* Secondary A *or* B *definition because of the variable characteristics of the rock type. These have only a minor value*." Note that a *Secondary B* aquifer is defined as an aquifer of "*…mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers*."

2.5.3 The Chalk Group, Upper Greensand Formation and Lower Greensand Group (specifically the Folkestone Formation) are designated *Principal* aquifers. These are defined by the Environment Agency[14] as follows.

- *Principal* aquifer: an aquifer that provides "*…significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands*."

Aquifer properties

2.5.4 The Folkestone Formation is regarded as generally homogenous, facilitating intergranular groundwater flow only. In hydrogeological settings where intergranular flow dominates, transmissivity is accordingly reduced[15]. There are no aquifer properties of the Folkestone Formation provided in the geological log of the

[14] Environment Agency, 14 March 2017. *Protect groundwater and prevent groundwater pollution*. Online: https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution [accessed November 2023].
[15] British Geological Survey (BGS), 2023. *Properties of the Lower Greensand aquifer*. Online: https://www2.bgs.ac.uk/groundwater/waterResources/thames/lowerGreensand.html [accessed November 2023].

abstraction well at Timberley Farm or in those of the three neighbouring boreholes. However, aquifer properties have been published[16] and are presented in Table 5.

Table 5 – Aquifer properties of the Folkestone Formation

Property	Units	Value	Comment
Transmissivity	m^2/day	Range: 150-1200 Geometric mean: 260	Aquifer properties data are limited and of variable quality. Aquifer properties were mainly observed in the northern limb of the Wealden Anticline. Ironstone hardbands can locally impede groundwater flow.
Hydraulic conductivity	m/day	Range: 5-20	
Storage coefficient	Dimensionless	**Unconfined** No data **Confined** 0.001-0.0004 0.02 (observed in Hardham, on the southern limb of the Wealden Anticline)	

Source: Allen, D.J., Brewerton, L.J., Coleby, L.M., MacDonald, A.M., Wagstaff, S.J. and Williams, A.T., 1997. *The physical properties of major aquifers in England and Wales.* British Geological Survey (BGS) Technical Report WD/97/34. 312pp. Environment Agency R&D Publication 8.

Groundwater elevation

2.5.5 The relatively high storage coefficient of the Folkestone Formation results in a characteristic steady groundwater elevation with minimal seasonality[15]. There are limited groundwater elevation data[6] of the Folkestone Formation available local to the abstraction well at Timberley Farm. Those data that are available are presented in Table 6.

Table 6 – Groundwater elevation of the Folkestone Formation local to the abstraction well at Timberley Farm

Name	Abstraction well at Timberley Farm BGS ID 21360821 BGS Reference: TQ01SW46	Name unknown BGS ID: 570329 BGS Reference: TQ01SW10	Name unknown BGS ID: 570334 BGS Reference: TQ01SW15	Hardham BH062 BGS ID: 570051 BGS Reference: TQ01NW19
Groundwater elevation (mbgl)	n/a	11.9*	Artesian**	n/a
Groundwater elevation (mAOD)	n/a	-4.9*	Artesian**	n/a
Ground elevation (mAOD)	16.7	7.0	6.4	13.0
National Grid Reference	TQ 02061 14232	TQ 01590 14160	TQ 01000 14440	TQ 00920 15050
Approximate distance from abstraction well at Timberley Farm (km)	-	0.5	1.1	1.4

[16] Allen, D.J., Brewerton, L.J., Coleby, L.M., MacDonald, A.M., Wagstaff, S.J. and Williams, A.T., 1997. *The physical properties of major aquifers in England and Wales*. British Geological Survey (BGS) Technical Report WD/97/34. 312pp. Environment Agency R&D Publication 8.

Table 6 – Groundwater elevation of the Folkestone Formation local to the abstraction well at Timberley Farm

Note
BGS = British Geological Survey
mbgl = metres below ground level
mAOD = metres above ordnance datum
n/a = not available
The ground elevation of the abstraction well at Timberley Farm (17.4 mAOD) was not provided in the geological log; it has been estimated using OS (Ordnance Survey) Maps online.

* The geological log states that there was a “plentiful supply” of water at the bottom of the borehole that was “probably from the Lower Greensand” Group.
** The geological log states "water overflows at surface at 1,500 gals per hour" (1.9 litres per second).

Source: unless otherwise stated, the source of the data is: British Geological Survey (BGS), 2023. *GeoIndex (onshore)*. Online: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [accessed November 2023].

3 HYDROGEOLOGICAL CONCEPTUAL SITE MODEL (HCSM)

3.1.1 The HCSM is presented in **Drawing ST20485-002**. The interpreted geology is based on a line of cross-section that starts at the abstraction well at Timberley Farm in the south-west and trends to the north-east, crossing the River Arun, Amberley Wild Brooks Nature Reserve and Pulborough Brooks Nature Reserve. Waltham Brooks Nature Reserve is not crossed by the line of cross-section; however, the line of cross-section is adjacent to Amberley Wild Brooks Nature Reserve and appears to be underlain by similar geology and therefore subject to similar conditions. Although the drawing is not to scale, the topography and interpreted geology are based on BGS mapping[12].

3.1.2 The abstraction well at Timberley Farm is screened in the Folkestone Formation. In the vicinity of the abstraction well, the Folkestone Formation is a confined aquifer, with the Gault Formation above it being impermeable.

3.1.3 Where the Folkestone Formation outcrops or is in hydraulic continuity with overlying permeable strata that themselves outcrop (e.g., the Folkestone Formation in hydraulic continuity with Alluvium and Peat), the Folkestone Formation is an unconfined aquifer. The nearest location to the abstraction well where the Folkestone Formation is unconfined is approximately 625 m to the north-east. Where the Folkestone Formation is unconfined, recharge will occur from infiltration of precipitation, either directly or via infiltration to the ground of surface runoff (runoff recharge).

3.1.4 The parasitic folds are likely to impede groundwater flow through the Folkestone Formation, as there will not be a continuous path wholly within the Folkestone Formation between the southward dipping limb in the vicinity of the abstraction well at Timberley Farm and the synclinal folded part in the north-east.

3.1.5 The River Arun is fed by springs, and therefore groundwater, to the east of Horsham[17]. In the vicinity of the abstraction well, however, the River Arun appears to be surface water fed. This is demonstrated by the apparent independence of its flows from the groundwater elevation of the Folkestone Formation: the River Arun has high peak flows but low summer flows (which correlate with patterns of rainfall). In contrast to

[17] Environment Agency, 22 June 2022. *Arun and Western Streams abstraction licensing strategy (ALS).* Online: https://www.gov.uk/government/publications/arun-and-western-streams-abstraction-licensing-strategy/arun-and-western-streams-abstraction-licensing-strategy-als [accessed November 2023].

this, the Folkestone Formation has a characteristic steady groundwater elevation with minimal seasonality[17].

3.1.6 There are limited data on the hydrogeology of the SSSIs. The SSSIs are underlain by outcrops of Alluvium and Peat and, by the theory of superposition (i.e., oldest sediments at the bottom and youngest sediments at the top), the bedrock immediately underlying these superficial strata are either the Gault Formation or Lower Greensand Group (including the Folkestone Formation). It is possible that the SSSIs are principally surface water-fed in the south, and become increasingly groundwater fed in the north of this cross-section.

4 ESTIMATES OF DRAWDOWN AND RADIUS OF INFLUENCE

4.1 Introduction

4.1.1 When the abstraction well at Timberley Farm is operated, there will be a characteristic lowering of the water table or potentiometric surface called a *cone of depression*. The edge of the cone of depression, which represents the extent to which the water table or potentiometric surface is influenced, is called the *radius of influence.* The difference in elevation between the rest water level and the pumping water level is called the *drawdown*.

4.1.2 This section uses an analytical hydrogeological equation to estimate the drawdown (at defined radii) and the radius of influence from the hypothetical operation of the abstraction well at Timberley Farm.

4.2 Equation

4.2.1 The analytical hydrogeological equation used is the Cooper-Jacob approximation for confined aquifers. The Environment Agency "Tier 1 Analytical Tools" spreadsheet (Version 1.6)[18] has been employed, which is a Microsoft-Excel-based spreadsheet that provides numerous analytical hydrogeological equations in a convenient format.

4.2.2 The Cooper-Jacob approximation for confined aquifers is as follows.

$$s = \frac{Q}{4\pi T} \ln \left[2.2459 \frac{Tt}{r^2 S} \right]$$

- s = drawdown [m]
- Q = abstraction rate [m^3/day]
- T = transmissivity [m^2/day]
- t = time [days]
- r = radial distance from abstraction well [m]
- S = storage coefficient [dimensionless]

4.2.3 The equation was used as presented to estimate drawdown at defined radii but rearranged to estimate radius of influence.

[18] Environment Agency, 25 January 2006. *Tier 1 Analytical Tools* spreadsheet. Version 1.6. Previously available online (https://www.gov.uk/government/publications/tier-1-groundwater-anaytical-equation-tool) but withdrawn 13 August 2014.

4.2.4 The estimates of drawdown at defined radii are presented in Table 7. The estimates of radius of influence are presented in Table 8. The Environment Agency's approach in their Tier 1 Analytical Tools spreadsheet is to round estimates to one decimal place (e.g., a value of 0.004482… m is rounded to 0.0 m), reflecting the precision of the equation.

4.2.5 The drawdown was estimated at three different radii from the abstraction well (10, 100 and 300 m) based on the varying values of aquifer properties presented in Table 5. The abstraction rate was kept constant at 15 m^3/day, reflecting a daily disaggregation of the maximum annual volume that the landowner of Timberley Farm is offering to offset (5.5 million litres per year[5]). Time was kept constant at 365 days (one year).

4.2.6 The radius of influence was similarly estimated based on the varying values of aquifer properties presented in Table 5, a constant abstraction rate of 15 m^3/day and a constant time of 365 days. Drawdown was kept constant at 0.1 m; this value was chosen rather than zero because using zero removes the influence of abstraction rate on the equation (when the equation is rearranged to find *r* rather than *s*, *r* becomes a numerator and *Q* becomes its denominator, which unrealistically makes *r* independent of *Q*).

4.2.7 This allowed a sensitivity analysis to be performed. The sensitivity analysis confirmed the following.

- When only transmissivity is varied, the larger the transmissivity the lower the drawdown and the lesser the radius of influence.
- When only storage coefficient is varied, the smaller the storage coefficient the higher the drawdown and the greater the radius of influence.
- When transmissivity and storage coefficient are both varied, the highest drawdown (0.1 m at a radius of 300 m) and the greatest radius of influence (46.3 m) are achieved from a combination of the smallest transmissivity (150 m^2/day) and the smallest storage coefficient (0.0002).

4.3 Precautionary Values

4.3.1 From the sensitivity analysis, precautionary values – so-called because they are based on a "worst case" scenario – can be highlighted as follows.

- Drawdown of 0.1 m at a radius of 300 m.

- Radius of influence of 46.3 m (or 50 m when rounded up) – see **Drawing ST20485-003** showing the radius of influence in relation to the closest part of Amberley Wild Brooks Nature Reserve.

4.3.2 The precautionary values are based on the assumptions of a constant abstraction rate of 15 m^3/day (in practice the abstraction rate would not be constant but intermittent, dependent upon the need to fill the storage tank), a constant time of 365 days (in practice the time would be less, dependent upon the need to fill the storage tank), and a combination of the published aquifer properties (Table 5) chosen to result in the largest drawdown and radius of influence.

4.3.3 Note that the apparent discrepancy between estimates of drawdown at 300 m and radius of influence (i.e., beyond the radius of influence the drawdown should be zero, but the estimates do not all conform to this) is due to the necessary use of a drawdown value of 0.1 m to represent zero, rather than using zero itself, when estimating the radius of influence.

Table 7 – Estimates of drawdown using the Cooper-Jacob approximation for confined aquifers										
Property	**Transmissivity**	**Storage coefficient**	**Abstraction rate**	**Time**	**Radius 1**	**Drawdown 1**	**Radius 2**	**Drawdown 2**	**Radius 3**	**Drawdown 3**
Symbol	**T**	**S**	**Q**	**t**	**r_1**	**s_1**	**r_2**	**s_2**	**r_3**	**s_3**
Units	**m^2/day**	**Dimensionless**	**m^3/day**	**day**	**m**	**m**	**m**	**m**	**m**	**m**
Value	150	0.02	15	365	10	0.1	100	0.1	300	0.0
	150	0.002	15	365	10	0.1	100	0.1	300	0.1
	150	0.0002	15	365	10	0.1	100	0.1	300	0.1
	260	0.02	15	365	10	0.1	100	0.0	300	0.0
	260	0.002	15	365	10	0.1	100	0.0	300	0.0
	260	0.0002	15	365	10	0.1	100	0.1	300	0.0
	1200	0.02	15	365	10	0.0	100	0.0	300	0.0
	1200	0.002	15	365	10	0.0	100	0.0	300	0.0
	1200	0.0002	15	365	10	0.0	100	0.0	300	0.0

Table 8 – Estimates of radius of influence using the Cooper-Jacob approximation for confined aquifers						
Property	**Transmissivity**	**Storage coefficient**	**Abstraction rate**	**Time**	**Drawdown**	**Radius of influence**
Symbol	**T**	**S**	**Q**	**t**	**s**	**None**
Units	**m^2/day**	**Dimensionless**	**m^3/day**	**day**	**m**	**m**
Value	150	0.02	15	365	0.1	4.6
	150	0.002	15	365	0.1	14.7
	150	0.0002	15	365	0.1	46.3
	260	0.02	15	365	0.1	0.1
	260	0.002	15	365	0.1	0.2
	260	0.0002	15	365	0.1	0.6
	1200	0.02	15	365	0.1	0.0
	1200	0.002	15	365	0.1	0.0
	1200	0.0002	15	365	0.1	0.0

5 SUMMARY OF POTENTIAL DRAWDOWN EFFECTS

5.1.1 The following evidence from this study suggests that any effects from the abstraction of groundwater from the Folkestone Formation at Timberley Farm would not impact water levels in the SSSIs in the vicinity of the River Arun.

- Waltham Brooks Nature Reserve and Pulborough Brooks Nature Reserve, the latter in the north-east of the cross-section (**Drawing ST20485-002**), are unlikely to require consideration. This is because they are a relatively long distance away from the abstraction well and are separated from the abstraction well by what appear to be parasitic folds.
- Amberley Wild Brooks Nature Reserve, in the south-west of the cross-section (**Drawing ST20485-002**), overlies the Gault Clay in the immediate vicinity of the abstraction well and is likely to be predominantly surface water fed.
- The abstraction well at Timberley Farm would abstract from the Folkestone Formation where it is confined, underlying an outcrop of the Gault Formation; Southern Water's Public Water Supply abstraction site in Hardham abstracts from the Folkstone Formation where it is predominantly unconfined, approximately 3.75 km away, and separated from the abstraction well by what appear to be parasitic folds.
- The precautionary values of drawdown and radius of influence from the hypothetical operation of the abstraction well are low compared to the distance to the edge of the unconfined aquifer (625 m) to the north-east – the nearest part of the Folkestone Formation where water level effects from abstraction could impact the groundwater-fed SSSIs (see **Drawing ST20485-003**).
- All the estimated values of drawdown and radius of influence are considered to be conservative, as these estimates were based on 365 days of continuous operation. In practice, however, operation would be intermittent and dependent on the need to fill the storage tank, so the extent of drawdown and radius of influence in reality would be expected to be lower than estimated.

5.1.2 It appears, therefore, that operating the abstraction well at Timberley Farm at an abstraction rate of 15 m^3/day would not have a significant effect on water levels in the nearby SSSIs and that it would be suitable for use in offsetting towards water neutrality.

6 RECOMMENDATIONS

6.1.1 Based on the findings of this HCSM report, it is recommended that a pumping test (constant rate test) – or pumping tests (variable rate / step test and constant rate test) – is carried out on the abstraction well at Timberley Farm. A pumping test would ascertain aquifer properties that can be used to refine the findings of this HCSM report, making the findings site specific rather than precautionary based on a 'worst case' scenario.

APPENDICES

APPENDIX 1

Photographs of Timberley Farm
(abstraction well location, storage tank and headworks detail)

Appendix 1 – Photographs

Timberley Farm, Bury – Borehole Location

APPENDIX 2

WR38 Borehole Record Form

Borehole record form

NICHOLLS BOREHOLES & GROUND SOURCE

British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

Water Resources Act 1991 (as amended by the Water Act 2003)

A Site details

Borehole drilled for: MR. J. BROMHEAD

Location: TIMBERLEY FARM, BURY, RH20 1NP

NGR (ten digits): TQ 02061 14232 Please attach site plan

Ground level (if known): _____ metres Above Ordnance Datum

Drilling company: NICHOLLS BOREHOLES

Date drilling commenced: 27-09-2022 (DD/MM/YYYY) Completed: 27-09-2022 (DD/MM/YYYY)

B Construction details

Borehole datum (if not ground level): _____ metres (m). Please tick if this is above ☐ or below ☐ ground level.
(point from which all measurements of depth are taken, for example, flange, edge of chamber)

Borehole drilled diameter: 200 mm from 0 to 77 m/depth

_____ mm from _____ to _____ m/depth

_____ mm from _____ to _____ m/depth

_____ mm from _____ to _____ m/depth

Casing material and type (for example, if plain steel, plastic slotted). Please record permanent casing details, not temporary casing.

Casing material: SOLID UPVC diameter: 125 mm from: 0 to: 50 m/depth

Casing material: SLOTTED UPVC diameter: 125 mm from: 50 to: 74 m/depth

Casing material: SOLID UPVC diameter: 125 mm from: 74 to: 77 m/depth

Casing material: _____ diameter: _____ mm from: _____ to: _____ m/depth

Grouting details: 5 BAGS WASHED SHINGLE, 8 BAGS OF MIKOLIT

Water struck at 1. N/A DRILLED m (depth below datum - mbd) 2. _____ m (mbd)

3. WITH MUD m (mbd) 4. _____ m (mbd)

C Test pumping summary (Please supply full details on form WR39)

Test pumping datum (if different from borehole datum): _____ m. Please tick if this is above ☐ or below ☐ ground level.

Pump suction depth: _____ mbd

Water level (start of test): _____ mbd

Water level (end of test): _____ mbd

Type of test (for example, bailer, step, constant rate)

_____

Pumping rate: _____ m^3/hour ☐ or litres/second ☐. Please tick as appropriate.

for: days, _____ _____ hours, mins _____

Recovery to _____ mbd in days, _____ _____ hours, mins _____
(from end of pumping)

Date(s) of measurements: Pump started (DD/MM/YYYY)

Pump stopped _____ (DD/MM/YYYY)

Please supply chemical analysis if available. If you have included this please tick this box ☐

D Strata log

Geological classification (BGS only)	Description of strata	Thickness m	Depth (to base of strata) m
	TOP SOIL	1	1
	FINE YELLOW SAND, BECOMING GREYER AT BASE	4	5
	GAULT CLAY	43	48
	FOLKESTONE BEDS - GREY SAND WITH OCCASIONAL BANDS OF SOFT SANDSTONE	29	77
	(continue on separate page if necessary)		
	Other comments (for example, gas encountered, saline water intercepted)		

E Completing this form

How long did it take you to fill in this form? ____

For Official use only

Date received (DD/MM/YYYY)	File	Consent number	BGS reference number
Accession number	Wellmaster number	SOBI number	NGR
LIC NO	Purpose		EA reference number
Copy number	Entered by		

The British Geological Survey will use the information you

APPENDIX 3

Pump and Filtration Installation Record

Pump & Filtration Installation Record

Customer Name	James Bromhead		
Customer Address	Timberley Farm, Bury, RH20 1NP		
Order Number	BH1337	Install Completion Date	22/6/23
Pump & Wet-End	VS2/10 0.55kW	Borehole Depth	77 mbgl
Liner diameter	125mm	Pump Depth	40 mbgl
Pipe Diameter	32mm	Borehole Grid Ref	TQ 02061 14232
Flow rate			

Equipment Installed

Nicholls Express Multi Panel – single phase
Float
Brass meter

Tank size: 20,000L
Above ground/below ground: Above
Access for cleaning: good, very tall tank – approximately 6m

Service Intervals, Requirements

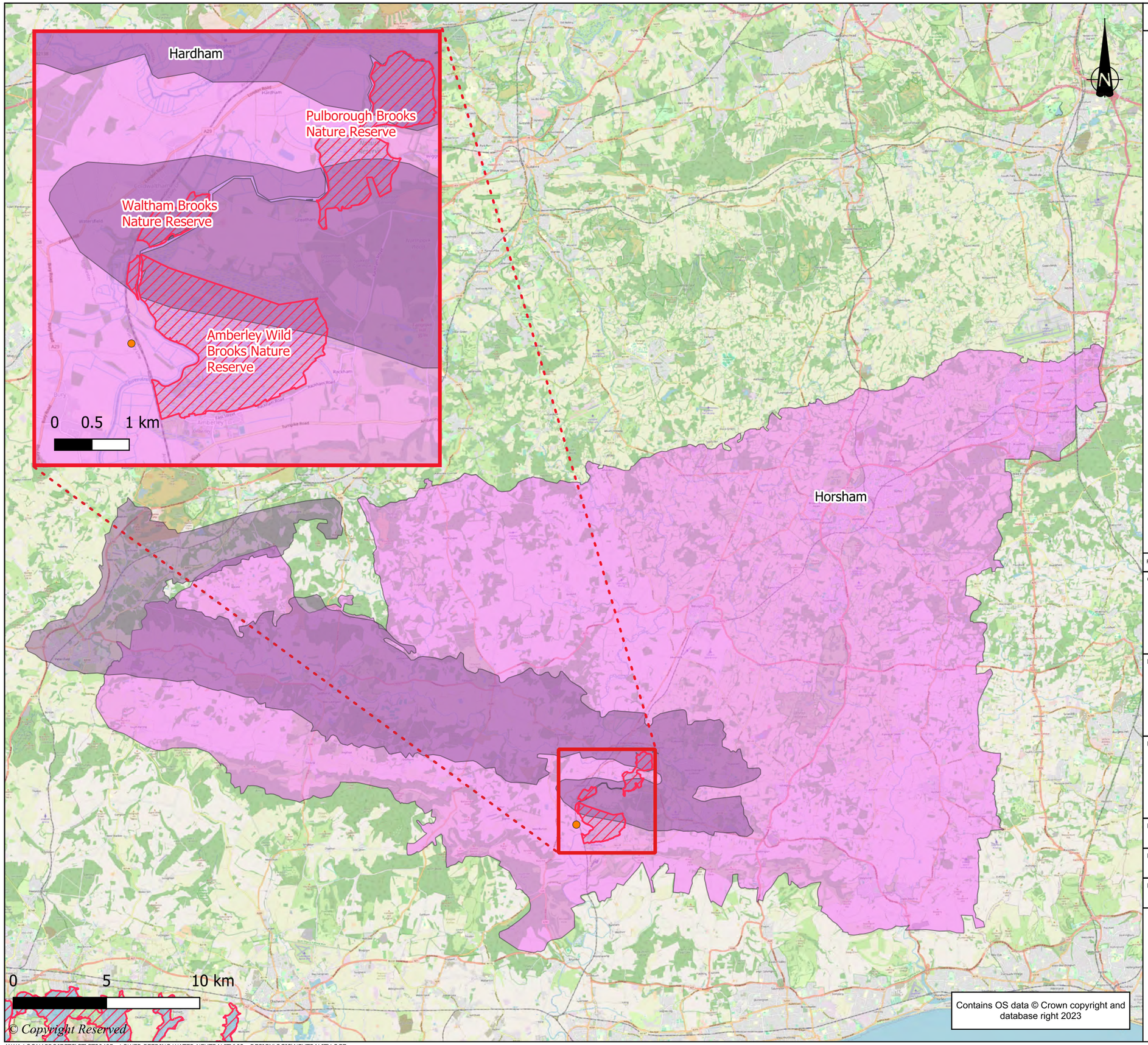
Site Notes				
Meter Reading – new so 0.0				
Pressure Vessel Pressure	Pressure Vessel Size			
Cable Insulation Value	Brown E >299	Black E >299	Grey E >299	Combined
Motor Winding Resistance	Brown-Black 15.2	Brown-Grey 20.4	Black-Grey 6.31	
Pump Controller Type – Nicholls Express Multi Panel – single phase				
Probe Depth High				
Probe Depth Low				
Capacitor Size – 20 uf				
Capacitor Reading				
PH Level				
Mains back up available Yes				

DRAWINGS

Drawing ST20485-001 Area of Interest

Drawing ST20485-002 HCSM (Geological Map and Cross-section)

Drawing ST20485-003 Radius of Influence



DO NOT SCALE FROM THIS DRAWING

KEY

- Sussex North Water Resource Zone
- Lower Greensand Arun & Western Streams Water Body
- Site of Special Scientific Interest
- Abstraction well at Timberley Farm

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D

CLIENT: ELIVIA HOMES

PROJECT: WATER NEUTRALITY

DRAWING TITLE: AREA OF INTEREST

DRG No.	REV
ST20845-001	-

DRG SIZE	SCALE	DATE
A3	1:200,000	December 2023

DRAWN BY	CHECKED BY	APPROVED BY
NB	CS	CS

wardell armstrong

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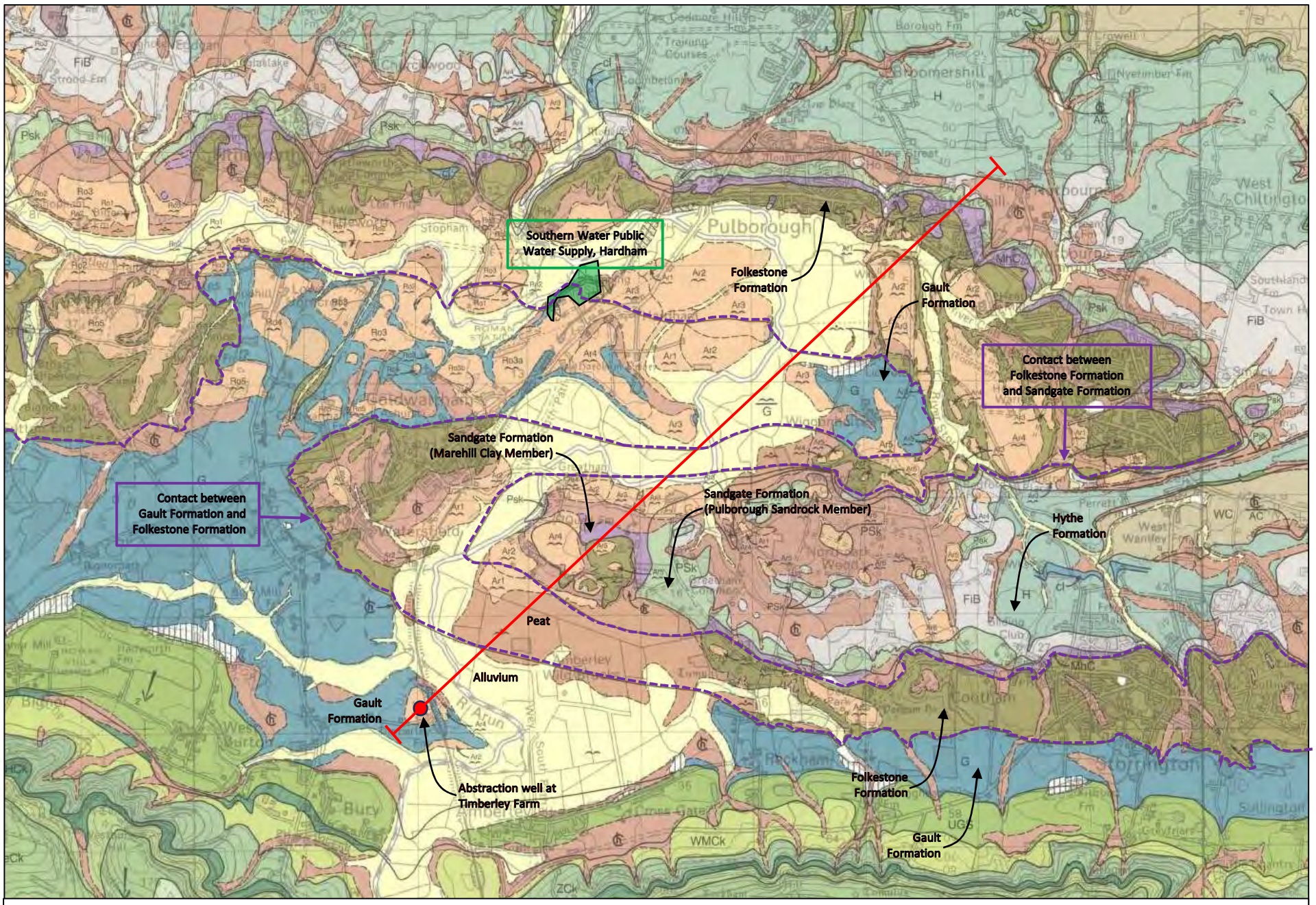
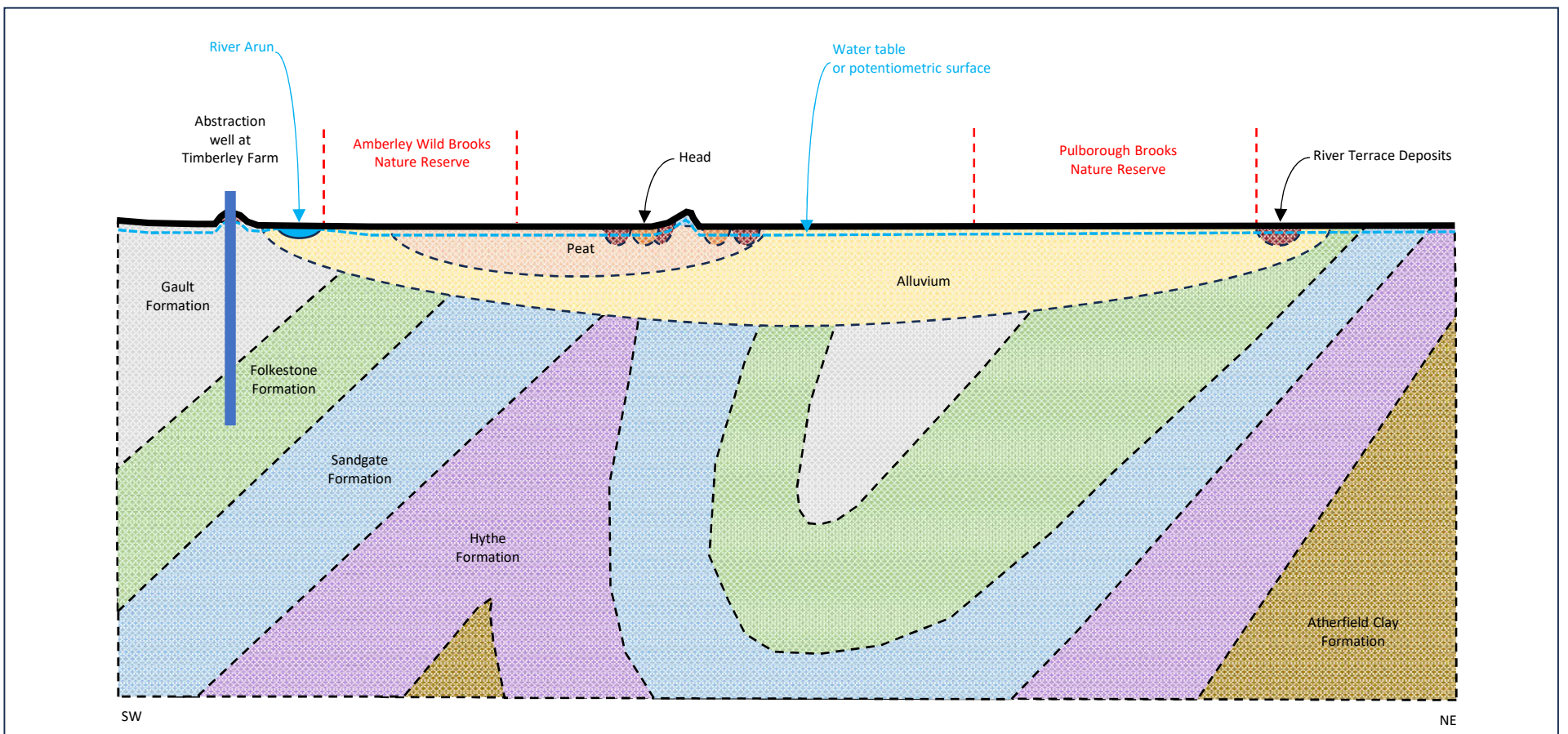
\\WA.LOCAL\PROJECTS\ST\ST20485 - LOWER BEEDING WATER NEUTRALITY\03 - DESIGN\QGIS\NEUTRALITY.QGZ

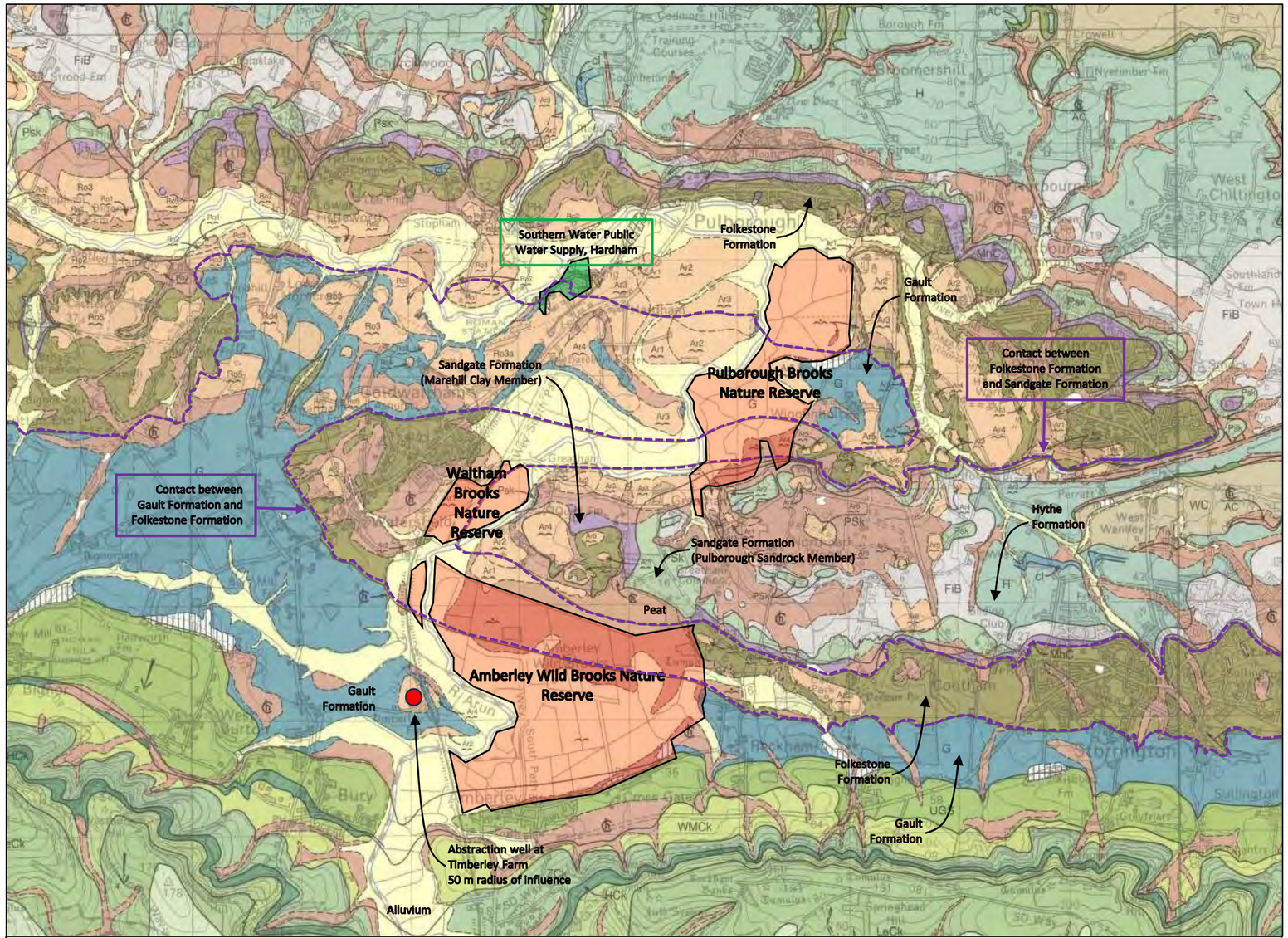


Orientation: north is grid north
Scale: 1:50,000 (one side of a grid square is 1 km)
Source: British Geological Survey (BGS), 1996. *Chichester and Bognor. England and Wales. Sheet 317/332. Solid and Drift Geology. 1:50,000*. Online: https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001807 [accessed November 2023].



Not to scale
Source: based on line of cross-section

wardell armstrong	**CLIENT**	Elivia Homes	**TITLE**	Hydrogeological Conceptual Site Model (Geological Map and Cross-section)	DRG No.	**DRAWN BY**	**APPROVED BY**	**DATE**
	PROJECT	Water Neutrality			ST20845-002	NB	CS	Dec-23



Orientation: north is grid north
Scale: 1:50,000 (one side of a grid square is 1 km)
Source: British Geological Survey (BGS), 1996. *Chichester and Bognor. England and Wales. Sheet 317/332. Solid and Drift Geology. 1:50,000*. Online: https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001807 [accessed November 2023].

● Radius of influence (50 m) of abstraction well at Timberley Farm

wardell armstrong	CLIENT	Elivia Homes	TITLE	Conceptual Model	DRG No.	DRAWN BY	APPROVED BY	DATE
	PROJECT	Water Neutrality			ST20845-003	NB	CS	Dec-23

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