

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 1 of 25

**AMBELLIA
CONSULTANCY**

Water Borehole Prognosis

Land Adjacent to Tudor Cottage Park Lane Cherhill Calne Wiltshire SN11 8XN



Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 2 of 25

**AMBELLIA
CONSULTANCY**

Executive Summary

- The target strata are those of the Upper Greensand Formation, the Lower Greensand Formation and the Corallian Group, requiring a drilled depth of 74 ± 5 m below ground level (bgl), based on drilling to the base of the Corallian Group. The predicted borehole characteristics are summarised in the table below.
- The estimated probability of obtaining $10 \text{ m}^3/\text{day}$ is 89 % (Fig. 9.1), however the pumped rate may have to be restricted to about $1 \text{ m}^3/\text{hr}$ to achieve this daily rate.

Target Aquifer	Upper Greensand Formation, the Lower Greensand Group and the Corallian Group
Borehole drilled depth below ground level (bgl)	74 ± 5 m bgl
	Based on drilling at to the base of the Corallian Group
Required water rate	$10 \text{ m}^3/\text{day}$
Estimated probability of obtaining $10 \text{ m}^3/\text{day}$	89 % (Fig. 9.1), however the pumped rate may have to be restricted to about $1 \text{ m}^3/\text{hr}$ to achieve this daily rate
Abstraction licence considerations	If it is the intention to restrict the water abstraction rate to a maximum of $20 \text{ m}^3/\text{day}$ it will not be necessary to obtain an abstraction licence. A consent to drill and test the borehole will also not be needed.
	Once the borehole has been drilled, a water abstraction licence would have to be obtained before the rate of abstraction could be subsequently increased to more than $20 \text{ m}^3/\text{day}$.
Estimated rest water level bgl	39 m bgl
Borehole location	At least 50 m upslope from foul water soakaways
Water Quality	90% probability of meeting drinking water quality standard after treatment for bacteria & iron
	The water quality should be tested by the local Council's Environmental Health Officer before being used for human consumption.
Borehole completion	The unconsolidated nature of the fine-grained sands of the Upper Greensand Formation, the Lower Greensand Group and the Corallian Group means that a sand pack and screen should be installed to prevent sand entering the borehole, which would severely restrict water production and damage the pump.
	The installation of the sand pack involves the direct placement of a coarser sand material around the screen. The minimum thickness of the sand pack should be 80 mm (Fig. 9.2).
	A plain liner should be installed from the surface to 15 m bgl, and the annulus between the plain liner and the formation should be grouted to a depth of 15 m bgl to help prevent contamination from surface waters.
	The remaining 59 m interval of the borehole should be completed with a slotted screen and sand pack.
	To retain the formation sands, the specification of the sand pack should be a D1 (only 1 % passing) of 0.6 mm, a D10 of 0.7 mm, a D30 of 0.75 mm, and a D60 of 1.0 mm. This corresponds to a BS410 mesh size range from 16 to 25 (1 mm to 0.6 mm). A 0.5 mm slotted screen would be required for this grade of sand pack.
	A dip tube should be installed to enable the monitoring of the borehole water level.
Borehole site elevation above ordnance datum (AOD)	129 m AOD
Expected Drilling Sequence	
0 to 9 m bgl	West Melbury Marly Chalk Fm: Limestone: grey, marly chalk, alternating soft & hard bands
9 to 25 m bgl	Upper Greensand Formation: Sand: fine-grained, glauconitic, micaceous
25 to 43 m bgl	Gault Formation: Mudstone: blue-grey, sandy
43 to 52 m bgl	Lower Greensand Group: sand & sandstone
52 to 66 m bgl	Kimmeridge Clay Formation: Mudstone: grey/brown, black, calcareous, kerogen-rich, locally sands and silts
66 to 74 m bgl	Corallian Group: Limestone: interbedded with sandstones, sands, siltstones, silts

Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 3 of 25

**AMBELLIA
CONSULTANCY**

Contents

Executive Summary

Contents

- 1.0 Introduction
- 2.0 Topographical Setting
- 3.0 Superficial Geology
- 4.0 Bedrock and Structural Geology
- 5.0 Predicted Geological Sequence Related to Depth
- 6.0 Discussion of Aquifers at the Site
- 7.0 Predicted Geological Sequence Related to Depth
- 8.0 Estimated Borehole Water Quality
- 9.0 Borehole Water Abstraction Licence Considerations
- 10.0 Borehole Construction and Probabilities of Obtaining the Required Water Quantity and Quality
- 11.0 Borehole Summary

This borehole study can only be used in relation to the supply of a water borehole at Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN. Dr. Robin Evans trading as Ambellia Consultancy retains the copyright of the borehole prognosis. This report was prepared with every possible effort to ensure that the work conforms to the accepted scientific practice. However, Dr. Robin Evans, trading as Ambellia Consultancy, makes no warranty, expressed or implied, and assumes no legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed. Dr. Robin Evans, trading as Ambellia Consultancy shall not be responsible for any consequential loss, howsoever caused, associated with the use of this borehole study.

Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 4 of 25

**AMBELLIA
CONSULTANCY**

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN

1.0 Introduction

Ambellia Consultancy was commissioned by Matthew B Downing Water Drilling Services Ltd to prepare a borehole prognosis for Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN.

Location maps are presented in Fig. 1.1.

The water demand for the site is expected to be up to 10 m³/day.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 5 of 25

**AMBELLIA
CONSULTANCY**

Figure 1.1
Location Maps



Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 6 of 25

**AMBELLIA
CONSULTANCY**

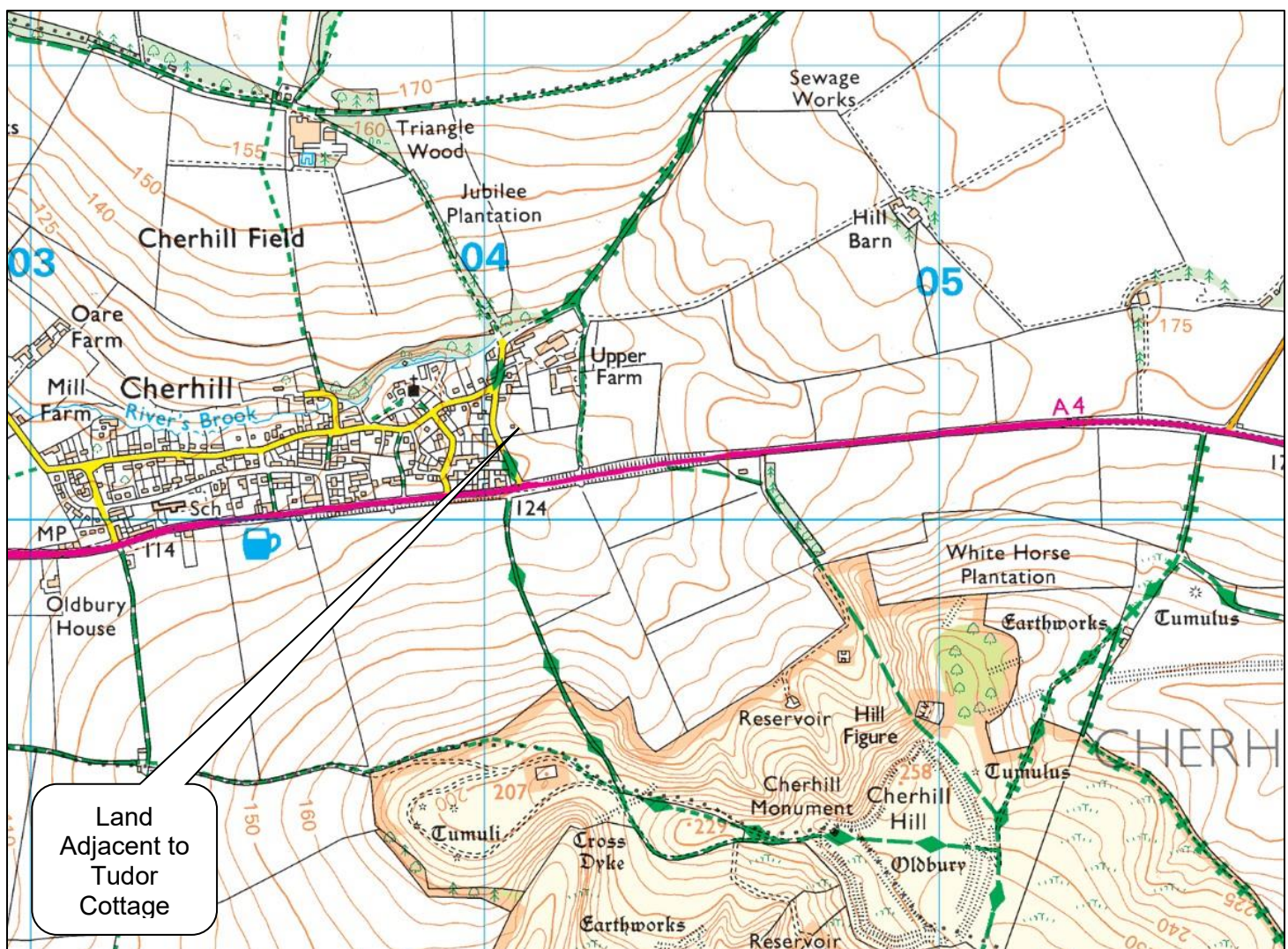
2.0 Topographical Setting

The site is located 4.2 km to the SE of the centre of Calne at National Grid Reference (NGR) SU 04064 70206 and at an elevation of 129 m above ordnance datum (AOD).

A detailed map of the local topography is presented in Fig. 2.1. A 3-D representation of the site with a 5 times vertical exaggeration is shown in Fig. 2.2.

The site is near the spring source of River's Brook, whilst the main channel of River's Brook 2.3 km to the W is at an elevation of 84 m AOD. 1.2 km to the SE the land rises to 258 m AOD at Cherhill Hill on the crest of the chalk escarpment.

Figure 2.1
Detailed Topographical Map of the Site



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 7 of 25

**AMBELLIA
CONSULTANCY**

Figure 2.2
3-D Topographical Map of the Site
(x5 vertical exaggeration)



Land
Adjacent
to Tudor
Cottage

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 8 of 25

**AMBELLIA
CONSULTANCY**

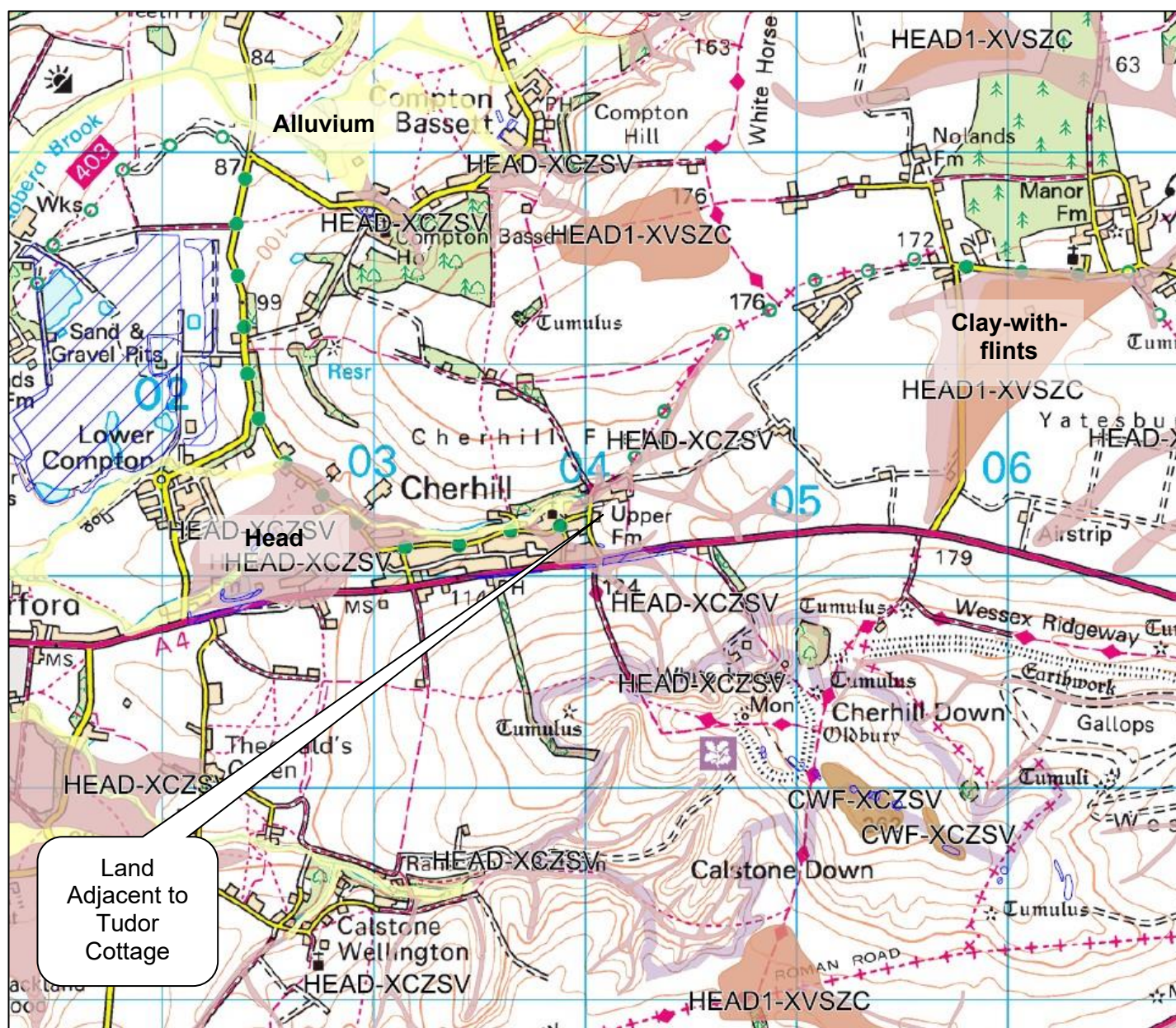
3.0 Superficial Geology

The surface superficial geology in the vicinity of the site is illustrated in Fig 3.1. The key to the colour coding of the superficial geology is presented in Fig. 3.2.

Superficial geology refers to the glacial and fluvio-glacial deposits left after the retreat of the glaciers and ice sheets associated with the last ice age, and landslip.

No superficial deposits are expected at the site.

Figure 3.1
Superficial Geology in the Vicinity of the Site



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 9 of 25

**AMBELLIA
CONSULTANCY**

Figure 3.2
Key to Superficial Geology

KEY TO SUPERFICIAL GEOLOGY				
Map Colour	LEX Code	Rock Name	Rock Type	Max Age (Period)
	ALV-XCZSV	Alluvium	Clay, Silt, Sand And Gravel	Quaternary
	HEAD-XCZSV	Head	Clay, Silt, Sand And Gravel	Quaternary
	HEAD1-XVSZC	Head, 1	Gravel, Sand, Silt And Clay	Quaternary
	CWF-XCZSV	Clay-With-Flints Formation	Clay, Silt, Sand And Gravel	Neogene

Water Borehole Prognosis

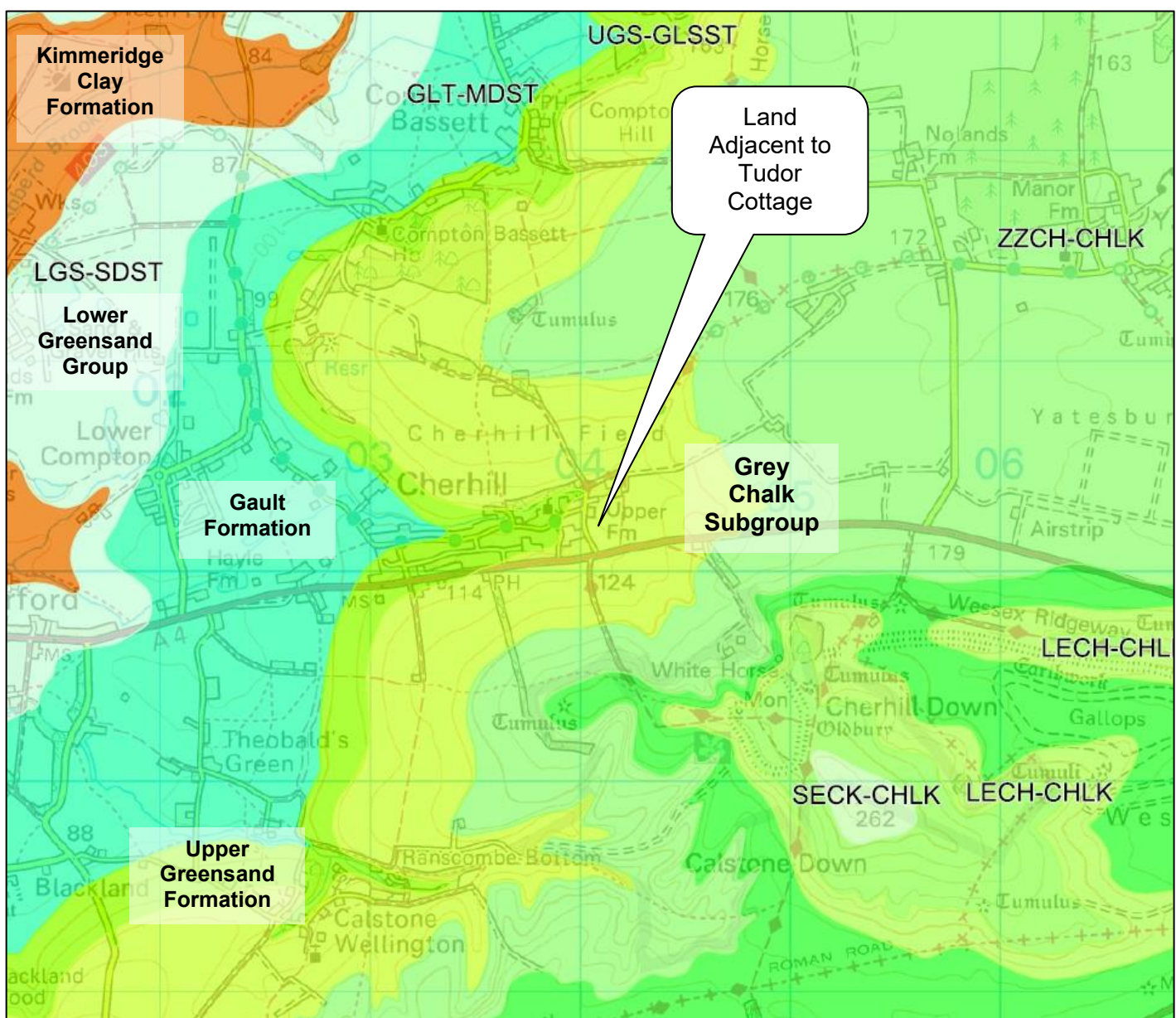
Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 10 of 25

4.0 Bedrock and Structural Geology

The bedrock and structural geology in the region of the site is illustrated in Fig. 4.1. The key to the colour coding of the bedrock geology is shown in Fig. 4.2. A '3D' representation of the bedrock geology is presented in Fig. 4.3.

The site is on the outcrop of the Grey Chalk Subgroup. The underlying sands & sandstones of the Upper Greensand Formation, the mudstones of the Gault Clay Formation, the sands of the Lower Greensand Group, the Kimmeridge Clay Formation and the interbedded limestones and sands of the Corallian Group outcrop, respectively, 0.2 km, 0.5 km, 2.1 km, 3.1 km and 3.6 km downslope to the W.

Figure 4.1
Solid & Structural Geology in the Vicinity of the Site



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 11 of 25

**AMBELLIA
CONSULTANCY**

Figure 4.2
Key to Bedrock Geology

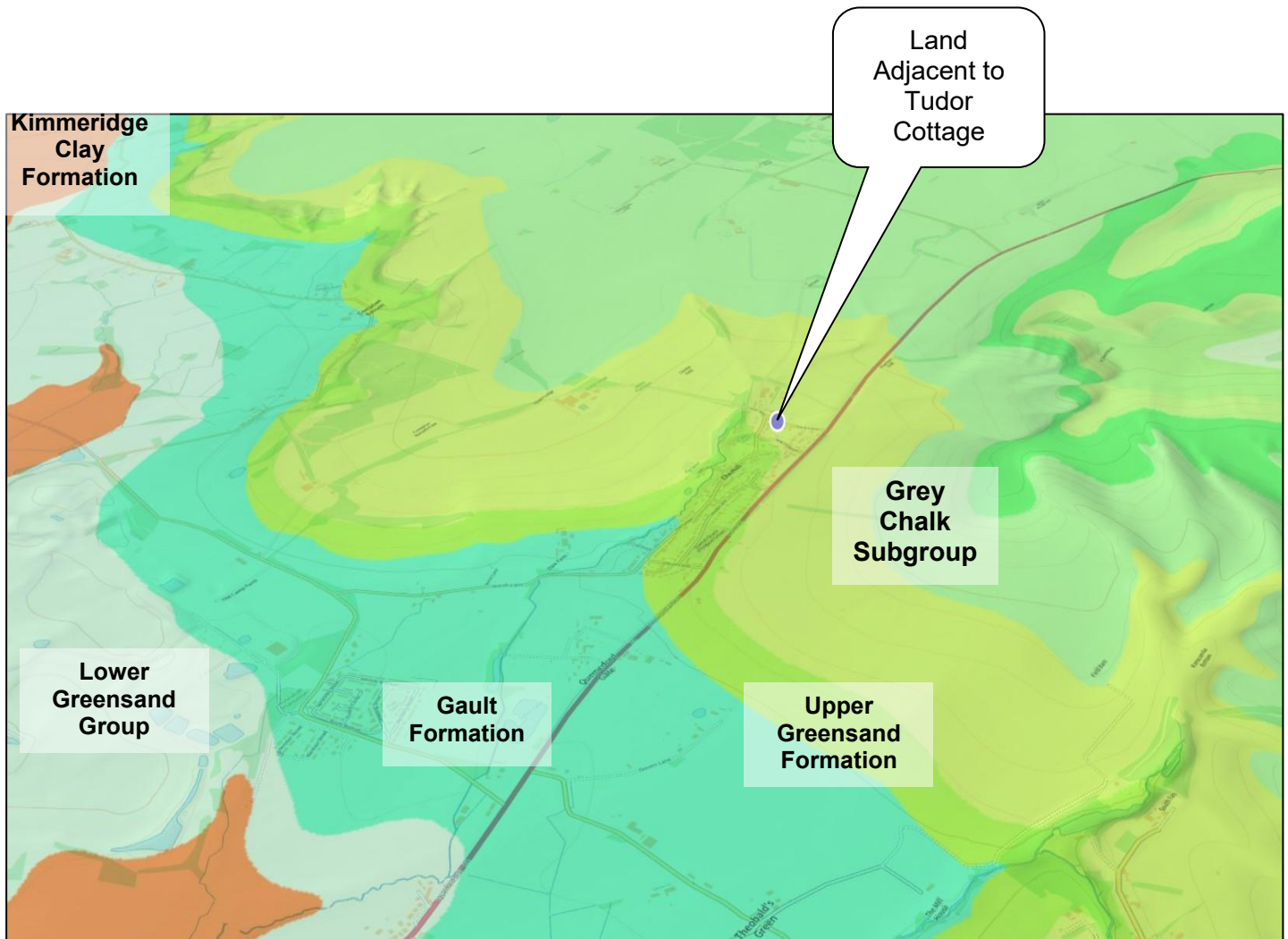
KEY TO BEDROCK GEOLOGY				
Map Colour	LEX Code	Rock Name	Rock Type	Max Age (Period)
	SECK-CHLK	Seaford Chalk Formation	Chalk	Cretaceous
	LECH-CHLK	Lewes Nodular Chalk Formation	Chalk	Cretaceous
	NPCH-CHLK	New Pit Chalk Formation	Chalk	Cretaceous
	HCK-CHLK	Holywell Nodular Chalk Formation	Chalk	Cretaceous
	WMCH-CHLK	West Melbury Marly Chalk Formation	Chalk	Cretaceous
	ZZCH-CHLK	Zig Zag Chalk Formation	Chalk	Cretaceous
	GLT-MDST	Gault Formation	Mudstone	Cretaceous
	UGS-GLSST	Upper Greensand Formation	Sandstone, Glauconitic	Cretaceous
	LGS-SDST	Lower Greensand Group	Sandstone	Cretaceous
	KC-MDST	Kimmeridge Clay Formation	Mudstone	Jurassic

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 12 of 25

**AMBELLIA
CONSULTANCY**

Figure 4.3
'3D' Map of Bedrock & Structural Geology



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 13 of 25

5.0 Borehole Predicted Geological Sequence Related to Depth

The predicted geological sequence related to depth at the site is shown in Fig. 5.1.

The top 9 m is predicted to be the chalk of the West Melbury Marly Chalk Formation, followed by 16 m of the sand and sandstone of the Upper Greensand Formation, 18 m of the mudstone of the Gault Formation, 9 m of the sand and sandstone of the Lower Greensand Group, 14 m of the mudstones (and thin sands & silts) of the Kimmeridge Clay Formation, 8 m of the limestones and sands of the Corallian Group and at least 100 m of the Oxford Clay Formation.

Figure 5.1
Predicted Geological Sequence Related to Depth (Potential Aquifers in Blue)

Age	Group/ Formation	Formation/ Member	Thickness (m)	Depth To Top (m)	Depth to Bottom	Description	Borehole Depth & RWL
Cretaceous		West Melbury Marly Chalk Fm	9	0	9	Limestone: grey, marly chalk, alternating soft & hard bands	
		Upper Greensand Fm	16	9	25	Sand & Sandstone: fine-grained, glauconitic	
		Gault Formation	18	25	43	Mudstone: blue-grey, sandy	
		Lower Greensand Group	9	43	52	Sand & Sandstone: fine-grained	
Jurassic		Kimmeridge Clay Formation	14	52	66	Mudstone: grey/brown, black, calcareous, kerogen-rich, locally sands and silts	
		Corallian Group	8	66	74	Limestone: interbedded with sandstones, sands, siltstones, silts	
		Oxford Clay Formation	100	74	174	Mudstone: grey, generally smooth to slightly silty	

Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 14 of 25

**AMBELLIA
CONSULTANCY**

6.0 Discussions of Aquifers at the Site

The target strata are those of the Upper Greensand Formation, the Lower Greensand group and the Corallian Group.

Lower Greensand & Corallian Group are classified as a Secondary A aquifer on a national basis, whilst the Chalk & Upper Greensand are classified as Principal aquifer (Figs. 6.1 & 6.2). The regional geological model is shown in Fig. 6.3

The Upper Greensand Formation which outcrops near the site is a thin perched aquifer and is not thought to have a sufficient saturated thickness for a sustainable borehole water supply.

Boreholes in the Lower Greensand Group & Corallian Group aquifer typically have a specific capacity of about 2 m³/d/m of drawdown in the borehole water level.

The unconsolidated nature of the sands means that a properly designed sand pack and screen would need to be installed to prevent sand entering the borehole.

Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail. robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 15 of 25

**AMBELLIA
CONSULTANCY**

Fig. 6.1.
Aquifer Classification Map

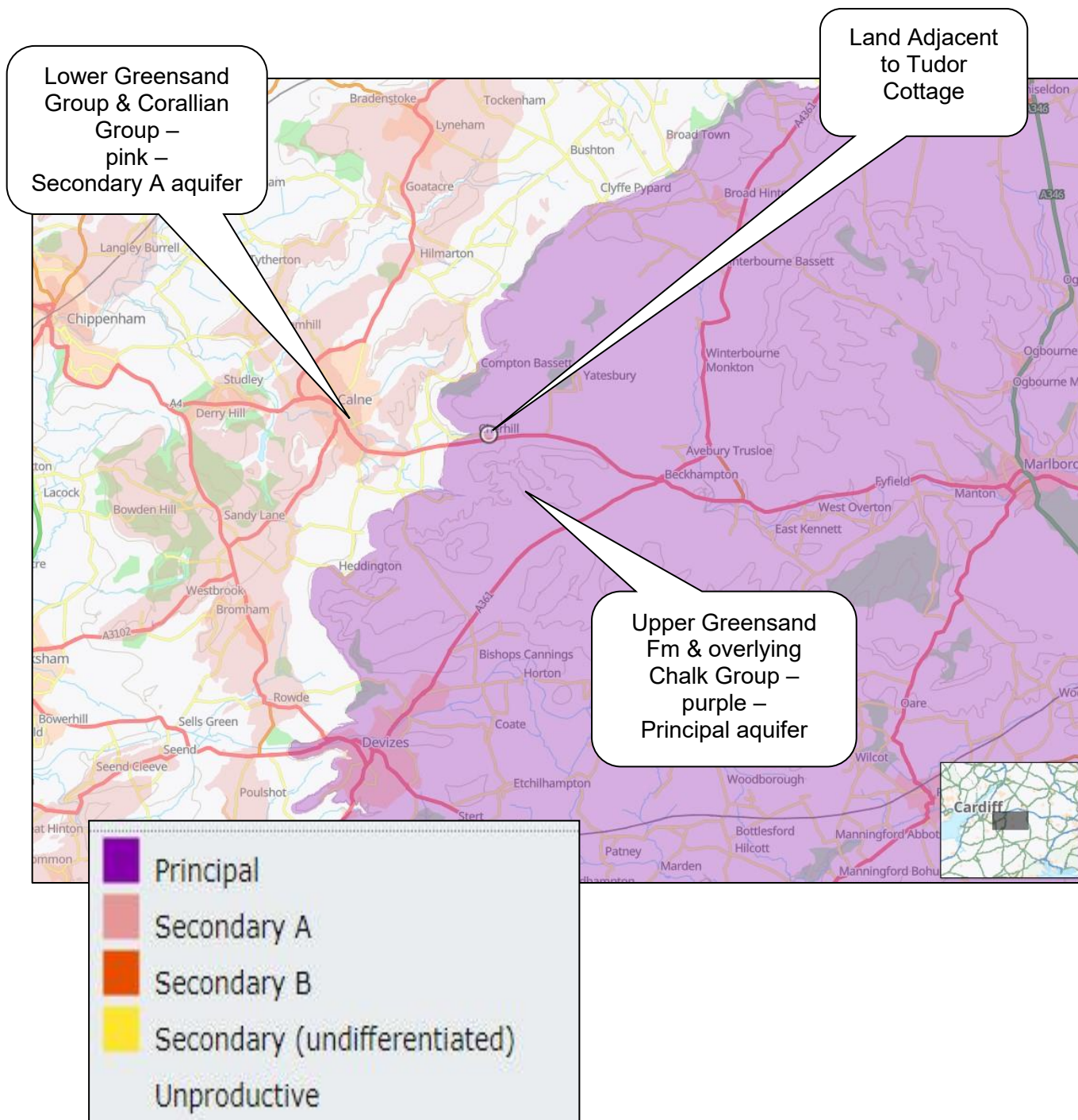


Figure 6.2
Aquifer Classification Descriptions

Principal Aquifers

- These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary Aquifers

These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

- Secondary A** - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;
- Secondary B** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
- Secondary Undifferentiated** - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata

These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

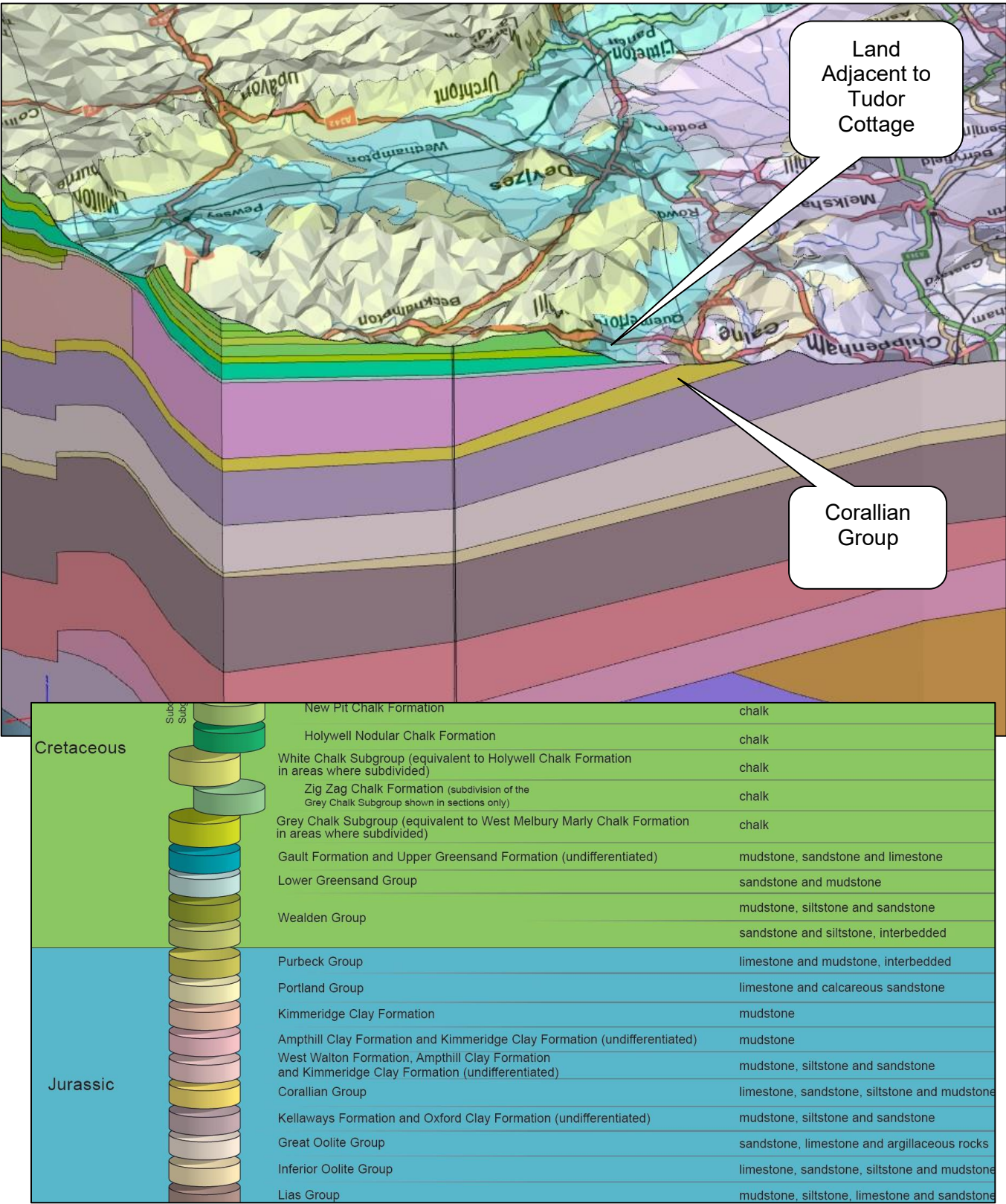
Note: Only the principal and secondary aquifers are displayed as coloured areas on the maps.
All uncoloured areas on the bedrock designation map will be unproductive strata.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 17 of 25



Figure 6.3
Regional Geological Model



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 18 of 25

7.0 Estimated Borehole Water Quality.

The borehole water is expected to be generally of drinking water quality standard after treatment for bacteria and iron (Fig 7.1).

The water quality should be tested by the local Council's Environmental Health Officer before being used for human consumption.

The local recharge area for the aquifers is within in a Nitrate Vulnerable Zone (NVZ) (Fig. 7.2). A total of 55% of England is designated as being within Nitrate Vulnerable Zones (NVZ).

The Nitrate Directive requires the designation, as Nitrate Vulnerable Zones, surface or underground waters that are or could be relatively high in nitrate from agricultural sources. The Nitrate Directive sets a nitrate concentration limit of 50 mg/l in drinking water. Within the NVZ strict controls on fertiliser applications are being implemented to reduce the potential for nitrate contamination.

Table 7.1
Estimated Water Quality for the Borehole

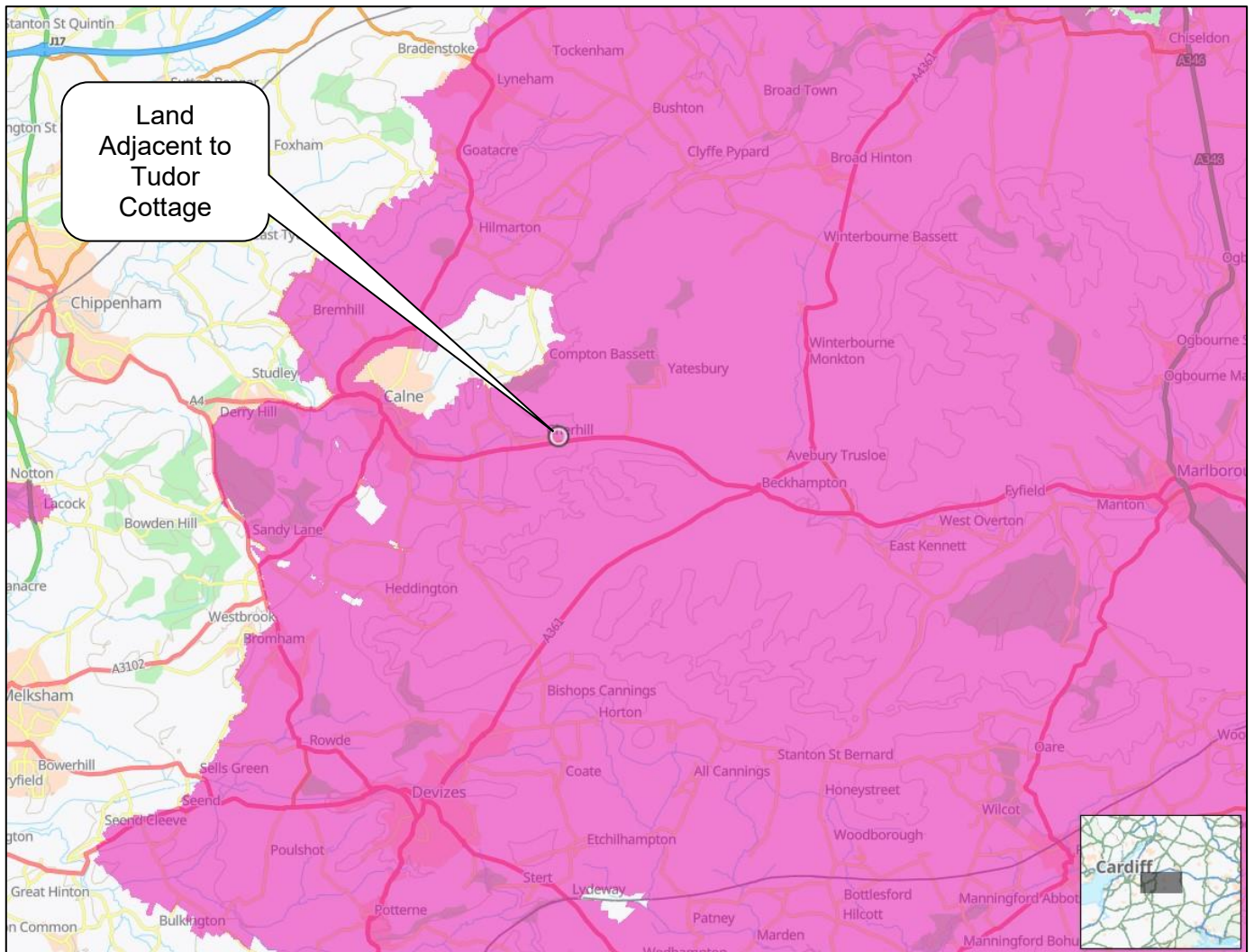
Parameter	Value
Calcium. ppm	80
Magnesium. ppm	10
Sodium. ppm	20
Potassium. ppm	5
Bicarbonate. ppm	130
Sulphate. ppm	20
Chloride. ppm	30
Total Dissolved Solids. ppm	300
pH	7.1

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 19 of 25

**AMBELLIA
CONSULTANCY**

Fig. 7.2
NVZ for the Region (Pink Areas)



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 20 of 25

**AMBELLIA
CONSULTANCY**

8.0 Borehole Water Abstraction Licence Considerations

The Environment Agency is the statutory body in England for strategic water resources planning and the management of water resources through the abstraction licensing system.

The Water Act (2003) has enabled the Environment Agency (EA) to set a threshold for borehole water abstraction rates requiring water abstraction licences.

This threshold is generally 20 m³/day regardless of use.

If it is the intention to abstract no more than 20 m³/day from the site it will be not necessary to obtain an abstraction licence from the EA.

A consent would also not be needed from the EA before drilling and testing the boreholes.

A water abstraction licence from the Environment Agency would be needed for the boreholes before subsequently increasing the water abstraction rate to more than 20 m³/day for the site.

In the case of abstractions of > 20 m³/day, the maximum licensed abstraction rate for the borehole that can be authorised by the Environment Agency will be influenced by the findings of the Catchment Abstraction Management Strategy (CAMS) for the local region.

The site is within a Source Protection Zone (SPZ) designated by the Environment Agency for all groundwater sources (wells, boreholes and springs) used for public drinking water supply (Fig. 8.1).

As the boreholes will be greater than 15 m in depth, notification of the intent to construct the borehole and technical information gained from its drilling and testing will still have to be supplied to the Natural Environment Research Council for scientific research purposes.

Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail. robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 21 of 25

**AMBELLIA
CONSULTANCY**

Fig. 8.1.
Source Protection Zones (SPZ) for the Region.



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 22 of 25

**AMBELLIA
CONSULTANCY**

9.0 Borehole Depth, Completion and Predicted Production

The target strata are those of the Upper Greensand Formation, the Lower Greensand Formation and the Corallian Group, requiring a drilled depth of 74 ± 5 m below ground level (bgl), based on drilling to the base of the Corallian Group.

The predicted borehole characteristics are summarised in Table 10.1

The estimated probability of obtaining 10 m³/day is 89 % (Fig. 9.1), however the pumped rate may have to be restricted to about 1 m³/hr to achieve this daily rate.

The estimated probability of the water quality meeting drinking water standards after treatment for bacteria and iron is 90%.

The rest water level is expected to be about 39 m below ground level.

The suggested borehole completion is as follows.

The unconsolidated nature of the fine-grained sands of the Upper Greensand Formation, the Lower Greensand Group and the Corallian Group means that a sand pack and screen should be installed to prevent sand entering the borehole, which would severely restrict water production and damage the pump.

The installation of the sand pack involves the direct placement of a coarser sand material around the screen. The minimum thickness of the sand pack should be 80 mm (Fig. 9.2).

A plain liner should be installed from the surface to 15 m bgl, and the annulus between the plain liner and the formation should be grouted to a depth of 15 m bgl to help prevent contamination from surface waters.

The remaining 59 m interval of the borehole should be completed with a slotted screen and sand pack.

To retain the formation sands, the specification of the sand pack should be a D1 (only 1 % passing) of 0.6 mm, a D10 of 0.7 mm, a D30 of 0.75 mm, and a D60 of 1.0 mm. This corresponds to a BS410 mesh size range from 16 to 25 (1 mm to 0.6 mm). A 0.5 mm slotted screen would be required for this grade of sand pack.

A dip tube should be installed to enable the water level to be monitored.

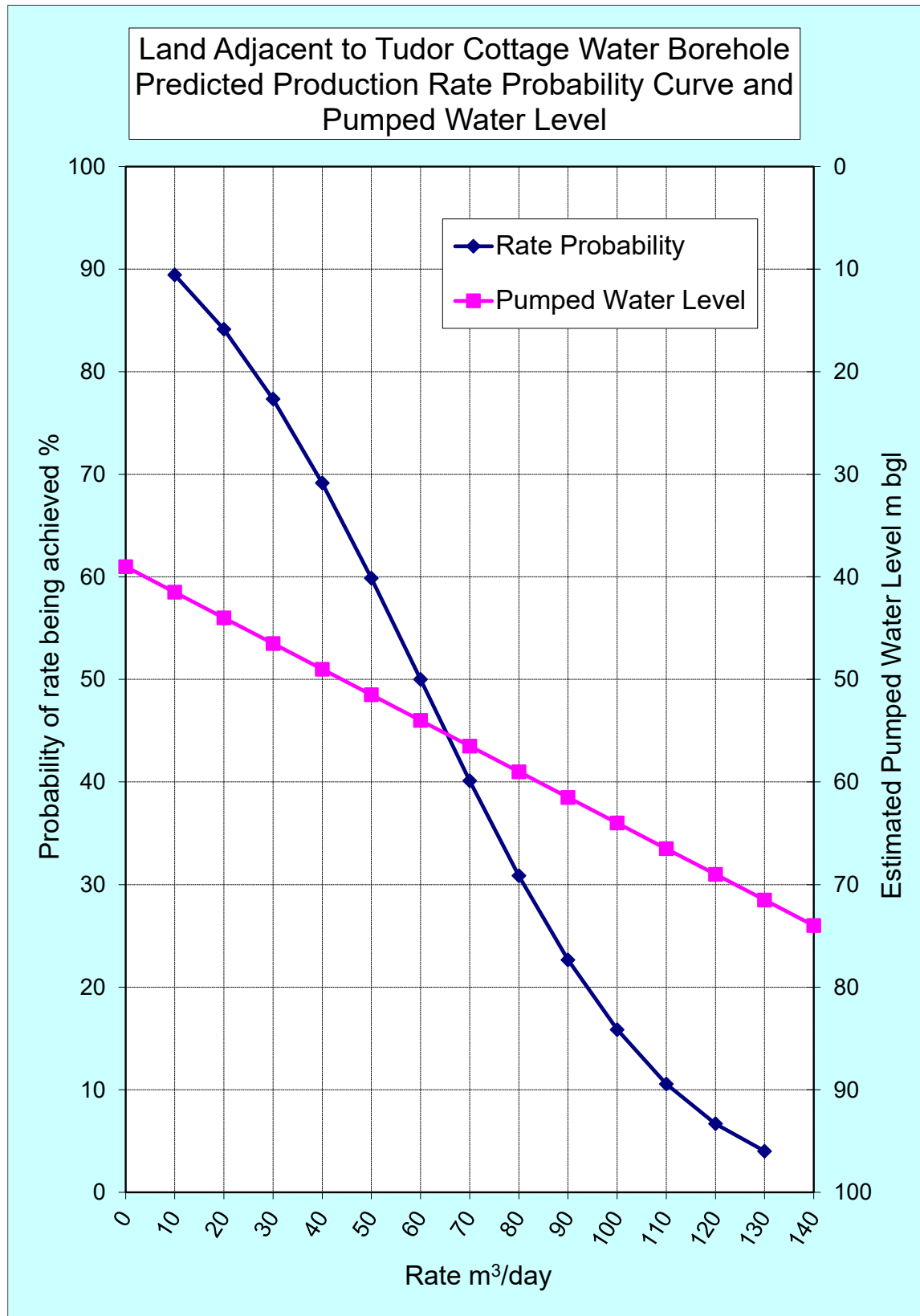
The borehole should be located at least 50 m upslope of any foul water soakaways.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 23 of 25

**AMBELLIA
CONSULTANCY**

Fig 9.1



Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

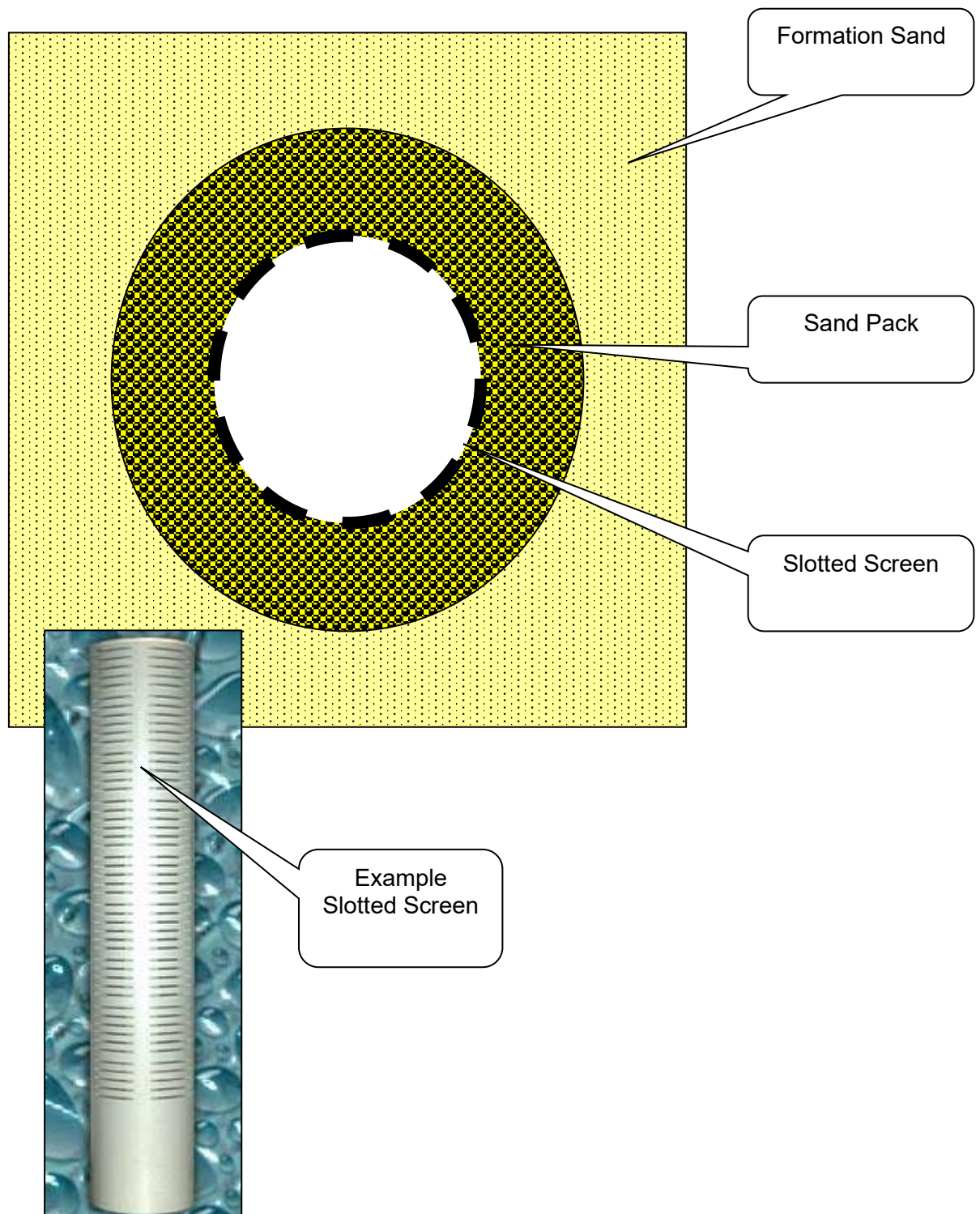
Robin Evans, B.Sc., M.Sc. MBA, Ph.D.

Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 24 of 25

**AMBELLIA
CONSULTANCY**

Fig 9.2
Schematic of Slotted Screen and Sand Pack Arrangement



Water Borehole Prognosis

Land Adjacent to Tudor Cottage, Park Lane, Cherhill, Calne, Wiltshire, SN11 8XN
Rev 00. August 2025. Order by Matthew B Downing Water Drilling Services Ltd
Page 25 of 25

**AMBELLIA
CONSULTANCY**

10.0 Borehole Summary

Target Aquifer	Upper Greensand Formation, the Lower Greensand Group and the Corallian Group
Borehole drilled depth below ground level (bgl)	74 ± 5 m bgl
	Based on drilling at to the base of the Corallian Group
Required water rate	10 m ³ /day
Estimated probability of obtaining 10 m ³ /day	89 % (Fig. 9.1), however the pumped rate may have to be restricted to about 1 m ³ /hr to achieve this daily rate
Abstraction licence considerations	If it is the intention to restrict the water abstraction rate to a maximum of 20 m ³ /day it will not be necessary to obtain an abstraction licence. A consent to drill and test the borehole will also not be needed.
	Once the borehole has been drilled, a water abstraction licence would have to be obtained before the rate of abstraction could be subsequently increased to more than 20 m ³ /day.
Estimated rest water level bgl	39 m bgl
Borehole location	At least 50 m upslope from foul water soakaways
Water Quality	90% probability of meeting drinking water quality standard after treatment for bacteria & iron
	The water quality should be tested by the local Council's Environmental Health Officer before being used for human consumption.
Borehole completion	The unconsolidated nature of the fine-grained sands of the Upper Greensand Formation, the Lower Greensand Group and the Corallian Group means that a sand pack and screen should be installed to prevent sand entering the borehole, which would severely restrict water production and damage the pump.
	The installation of the sand pack involves the direct placement of a coarser sand material around the screen. The minimum thickness of the sand pack should be 80 mm (Fig. 9.2).
	A plain liner should be installed from the surface to 15 m bgl, and the annulus between the plain liner and the formation should be grouted to a depth of 15 m bgl to help prevent contamination from surface waters.
	The remaining 59 m interval of the borehole should be completed with a slotted screen and sand pack.
	To retain the formation sands, the specification of the sand pack should be a D1 (only 1 % passing) of 0.6 mm, a D10 of 0.7 mm, a D30 of 0.75 mm, and a D60 of 1.0 mm. This corresponds to a BS410 mesh size range from 16 to 25 (1 mm to 0.6 mm). A 0.5 mm slotted screen would be required for this grade of sand pack.
	A dip tube should be installed to enable the monitoring of the borehole water level.
Borehole site elevation above ordnance datum (AOD)	129 m AOD
Expected Drilling Sequence	
0 to 9 m bgl	West Melbury Marly Chalk Fm: Limestone: grey, marly chalk, alternating soft & hard bands
9 to 25 m bgl	Upper Greensand Formation: Sand: fine-grained, glauconitic, micaceous
25 to 43 m bgl	Gault Formation: Mudstone: blue-grey, sandy
43 to 52 m bgl	Lower Greensand Group: sand & sandstone
52 to 66 m bgl	Kimmeridge Clay Formation: Mudstone: grey/brown, black, calcareous, kerogen-rich, locally sands and silts
66 to 74 m bgl	Corallian Group: Limestone: interbedded with sandstones, sands, siltstones, silts

Ambellia Consultancy

6 Frazier's Folly, Siddington, Cirencester, Gloucestershire, GL7 6HR, UK.

Tel/Fax: +44-(0)1258-472365. Mobile: 07879-400343. E-mail: robinevans@ambellia.co.uk

Robin Evans, B.Sc., M.Sc. MBA, Ph.D.