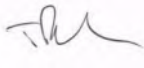
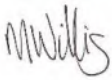
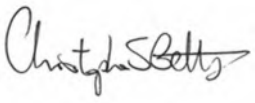




Foul and Surface Water Management Appraisal -
Monmouthshire Council Local Development Plan candidate site
Land at Llanellen Court, Llanellen, Monmouthshire
On Behalf of
David Morgan

Quality Management

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<i>Appendix B</i>	<i>Proposed site layout plan - northern area</i>
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1 Introduction

1.1 Background

Hydrogeo Limited (Hydrogeo) have been commissioned by David Morgan (the Client) to undertake a Foul and Surface Water Management Appraisal Report for 2 no. adjacent parcels of land at Llanellen Court, Llanellen, Monmouthshire (the Site).

This report has been prepared to promote the Site for inclusion in the Monmouthshire County Council (MMC) Local Development Plan (LDP) for residential land use. In order for the Site to be subject to a successful future planning application the surface and foul water discharges would need to meet current planning requirements.

1.2 Surface Water Discharge Planning Requirements

A development of more than 100 square metres would need a Sustainable Drainage System (SuDS) designed, submitted to and approved by the Monmouthshire Council SuDS Approving Body (SAB) in order to gain full planning approval.

A Sustainable Drainage System is designed to replicate, as closely as possible, the natural drainage from a site (before development) to ensure that the flood risk downstream of that site does not increase as a result of the land being developed.

SuDS can also significantly improve the quality of water leaving a site and can enhance the amenity and biodiversity that a site has to offer.

The implications of the SuDS requirements for development at the Site are a key focus of this report, and are discussed in greater detail in Section 4, with discussion of the site-specific options included in Section 6.

1.3 Foul Water Discharge Planning Requirements

National Resources Wales (NRW) have set targets for water quality in the River Usk Special Area of Conservation (SAC) in response to evidence about the negative environmental impact of phosphates (P) on the watercourse. The Site falls within the River Usk Phosphorous Sensitive Area, as shown on the MMC plan attached at Appendix A, where water quality targets have been exceeded in 88% of the waterbodies in the catchment.

In order to prevent the water quality falling further new developments within the catchment need to demonstrate P neutrality or betterment as part of their design. This is likely to include a number of measures, such as reducing the volume and concentration of waste water discharged from a site by through increased efficiency, and taking high-P producing land out of use and replacing with low-P producing land, either within the planning site or within the same river catchment.

Discussion of P reduction and land-offsetting options have been discussed in greater detail in Section 5, with discussion of the site-specific options included in Section 6.

2 Location & Development Description

2.1 Site Location

The Site is located on land off the A4042 at Llanellen Court, Llanellen, Monmouthshire, NP7 9HP. The National Grid Reference for the Site is 330272, 210579.

The location of the Site has been shown in Figure 2-1 and the Site boundary has been shown in Figure 2-2.

Figure 2-1 Site location



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Figure 2-2 Site boundary

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2.2 Existing Development

The Site comprises 2 no. undeveloped parcels of land at Llanellen Court, as shown in Figure 2-2. The northern parcel of land has an area of approximately 3.6ha and is currently used for pasture. The southern parcel has an area of approximately 2.1ha and is currently used as a dog training area.

The northern parcel falls towards the north east with a break in slope halfway to a level area at the northern half. The maximum elevation at the northern parcel is approximately 64m above ordnance datum (mAOD) along the south west boundary, and the minimum elevation is approximately 53mAOD across the flat northern part.

The southern parcel falls gently towards the north east. The maximum elevation at the northern parcel is approximately 64m above ordnance datum (mAOD) at the far south west corner, and the minimum elevation is approximately 56mAOD at the north east corner.

Both parcels of land fall within a wider ownership boundary which includes a number of former farming buildings, residential buildings and temporary dwellings.

2.3 Potential Development

Both parcels of land at the Site are LDP candidate sites for MMC, with a proposed residential end use. Planning permission for development at the Site has not been sought.

Layout plans for each of the parcels of land have been attached at Appendix B.

2.4 Geology

British Geological Survey (BGS) data have been used to describe the geology below the Site.

Artificial Geology

No artificial geology is indicated to be present below the Site on BGS mapping.

Superficial Geology

Superficial deposits are present at the Site and comprise mainly Glaciofluvial Sheet Deposits. These are sand and gravel deposits formed by glacial processes during the Quaternary Period within the last 2 million years.

Superficial deposits at the flat northern part of the northern parcel of land are marked as Alluvium: clay, silt, sand and gravel deposited in a fluvial environment during the Quaternary Period within the last 2 million years.

Bedrock Geology

BGS mapping indicates that the bedrock geology present at the Site comprises the St. Maughans Formation, which consists of fluvially derived interbedded sandstone and argillaceous rocks dating from the Devonian Period, approximately 393 to 419 million years ago.

2.5 Hydrogeology

The following aquifer classifications have been assigned by NRW to the superficial and bedrock geology below the Site:

- Groundwater vulnerability, superficial geology: *Medium vulnerability, secondary aquifer.*
- Groundwater vulnerability, bedrock geology: *Medium vulnerability, secondary aquifer.*
- Aquifer designation, superficial geology: Secondary A.
- Aquifer designation, bedrock geology: Secondary A.

Secondary A Aquifers are 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.

Soil Type

Information from the National Soil Resource Institute¹ identifies the Site as being situated on Soilscape 6: freely draining slightly acid loamy soils.

2.6 Catchment Hydrology

Available Ordnance Survey (OS) mapping has been used to determine the surface water features in the vicinity of the Ownership Site.

¹ <https://www.landis.org.uk/soilscales/>

A site walkover was conducted by Hydrogeo on the 30th July 2021 in order to identify surface water features and gain an understanding of the general site layout relative to site drainage. The site walkover is discussed in Section 3.

No surface water features are present within the boundary of the Site. OS mapping indicates that a spring is present 210m south west of the northern parcel of land. The spring feeds a small pond to the west of residential buildings within the site ownership boundary; the pond outfall is then culverted below an area of woodland down slope to the north east, in the direction of the Site. The culvert is concrete and approximately 25cm diameter.

An outfall for the culvert could not be identified within the boundary of the Site during a site visit by Hydrogeo in July 2021 (Section 3). Based on the direction of flow and the topography it is likely that the culverted watercourse continues below the northern parcel of land at the Site.

The River Usk is located 300m north east of the Site at its closest point. OS mapping indicates a spring and a watercourse outfall into the River Usk at this location adjacent to the Llanellen Bridge. It is possible that the culverted watercourse below the Site outfalls in this area and discharges to the River Usk.

A plan of the surface water features in the vicinity of the Site has been shown on Drawing 1.

2.7 Flooding

NRW data have been used to summarise the flood hazards at the Site. A plan of the flooding hazards has been shown on Drawing 2.

Flooding from Rivers and Sea

- The Site is not at risk of flooding from the sea.
- The Site is not at risk of flooding from rivers.

Flooding from Surface Water and Small Watercourses

- The Site is not at risk of flooding from small watercourses.
- A small area at the north eastern corner of the northern parcel of land at the Site is at high risk of surface water flooding.
- A small strip of land at the south western corner of the southern parcel of land at the Site is at low risk of surface water flooding.

2.8 Sensitive Land Uses

NRW data has been used to determine whether any sensitive land uses are present in the vicinity of the Site.

The development of the Site and the requirement to offset P may present opportunities for improvement of these sensitive land use areas, should this be acceptable and should they require it.

A list of sensitive land uses has been shown below:

- SSSI: River Usk (Lower Usk) located 0.3km NE

- SAC: River Usk located 0.3km NE
- AONB: None within 2km
- Local Nature Reserve: None within 2km
- National Park: Brecon Beacons NP located 0.3km W
- RAMSAR: None within 2km

2.9 Sewers

Sewer plans have been requested from Dŵr Cymru Welsh Water (DCWW) in order to identify possible foul water discharge points; the sewer plan and DCWW correspondence has been attached at Appendix C.

DCWW sewers and private sewers are present at the adjacent existing residential development to the north west of the Site. Additionally, DCWW sewer is present below the A4042 to the north of the Site.

DCWW have confirmed that connection to the sewer at this location below the A4042 is acceptable:

“We have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system. We advise that the flows should be connected to the foul sewer at or downstream of manhole SO30104701 located in highway/road to the North East.”

3 Site Walkover

3.1 Introduction

A site walkover was conducted by Hydrogeo on the 30th July 2021 in order to identify surface water features and gain an understanding of the general site layout relevant to drainage.

Photographs taken during the site walkover have been shown in Table 3-1. A plan of the photograph locations has been shown in Drawing 3.

Table 3-1 Site walkover photographs

Reference	Description	Photograph
1	Looking north from the southern boundary of the northern parcel of land.	
2	Looking north from the south western corner of the northern parcel of land.	

Reference	Description	Photograph
3	Looking east from the western boundary of the northern parcel of land. The break of slope to the flat section of this area of the Site is visible.	
4	Looking south from the north eastern corner of the northern parcel of land.	
5	Looking south west from the northern boundary of the southern parcel of land. The poultry farming sheds are visible at the edge of the site boundary.	

Reference	Description	Photograph
6	Looking south east from the northern boundary of the southern parcel of land.	
7	Looking north from the far south east corner of the Site.	
8	Culvert conveying a watercourse towards the north east. Entrance to the culvert is located outside site boundary but within the Client ownership boundary.	

4 Surface Water Discharge Requirements

4.1 Introduction

Any development at the Site exceeding 100m² will require a SuDS design to be submitted to the MMC SAB to ensure that surface water runoff is managed sustainably, and without increasing the flood risk both to the Site and to off-site receptors.

The SuDS design would need to comply with the SuDS Standards as presented in the 2018 'Statutory Standards for Sustainable Drainage Systems – Designing, constructing, operating and maintaining surface water drainage systems'.

The six standards that need to be met are as follows:

- S1 – Surface water runoff destination
- S2 – Surface water runoff hydraulic control
- S3 – Water Quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Designing drainage for construction, operation, maintenance and structural integrity

This section of the report will outline what is required to meet these standards. Discussion of the current options which are available at the Site, and what works/investigation may be required in order to implement a successful SuDS design has been presented in Section 6.

The focus will be on the significant site-layout factors which need to be addressed at an early stage: the surface water runoff destination and hydraulic control. The remaining aspects of water quality, amenity, biodiversity and construction considerations can be built into a SuDS design as it evolves.

4.2 S1 - Surface Water Runoff Destination

The surface water discharge destination is prioritised into 5 no. categories:

- Priority Level 1: Collect for reuse;
- Priority Level 2: Infiltrate to ground;
- Priority Level 3: Discharge to a surface water body;
- Priority Level 4: Discharge to a surface water sewer, highway drain, or another drainage system;
- Priority Level 5: Discharge to a combined sewer.

The discharge destinations are discussed below based on the residential end use development proposals for the Site.

Priority Level 1: Collect for reuse

The highest priority is to reuse surface water runoff within the development. This typically involves rain water harvesting (RWH) systems installed in residential dwellings; either as gravity-fed systems at roof level in the attic spaces, or pumped sub-surface systems adjacent to the property.

Rainwater is collected and distributed to certain appliances and outlets at the property as a non-potable source; these can include washing machines, toilets and exterior washing/irrigation facilities.

Gravity RWH systems installed in attic spaces require consideration of their level with respect to the guttering around the perimeter of the property for collection of rainwater; an installation location within the living space of the upper floor may be more suitable in some cases. The supply pressure available from a gravity RWH system, and the structural loading on the property should be taken into consideration when designing the system.

A sub-surface external pumped system prevents the loss of habitable space within the property however sterilises some of the land available for soft landscaping immediately surrounding it. The ongoing maintenance of a pumped system needs to be taken into account during design, along with the consideration of a backup supply should the system fail.

RWH systems can contribute to SuDS Standard S2 - Hydraulic Control (discussed in Section 4.3) but additional attenuation storage may be required, therefore the remaining discharge destinations would need to be investigated.

Priority Level 2: Infiltrate to ground

Discharging surface water runoff to ground represents increased fluvial flood protection when compared with a discharge to a surface watercourse, and better replicates the natural pathway of water falling as rain onto an undeveloped greenfield site and then infiltrating the soil.

Infiltration to ground can be achieved by a number of different unlined SuDS devices, including cellular soakaways, infiltration basins, swales and rain gardens. Many of these devices can also contribute to amenity, biodiversity and pollution mitigation benefits for the whole Site.

The option to infiltrate to ground is particularly important where a site has no other lower-priority discharge options available, such as a surface watercourse or sewers. However the ground conditions at a site must be proven to be suitable for this discharge option to be viable. Information from the National Soil Resource Institute² identifies the Site as being situated on Soilscape 6: freely draining slightly acid loamy soils.

Soakaway testing should be undertaken to BRE Digest 365 - Soakaway Design (2016) guidelines in order to determine if infiltration is viable.

Priority Level 3: Discharge to a surface water body

Discharging surface water runoff from a site to a surface waterbody may require mitigating measures to be put in place to ensure there is no increased fluvial flooding risk downstream.

² <https://www.landis.org.uk/soilscapes/>

The final discharge to a surface water body from a developed site should aim to replicate, as closely as possible, the natural (greenfield) runoff conditions from the site. This hydraulic control is discussed in Section 4.3.

Due to the potential land-take requirement for SuDS attenuation features their inclusion within the design of a site should be taken into account at the earliest opportunity.

Priority Level 4 and 5: Discharge to sewers and highway drains

If all preceding priority discharge destinations have been deemed unsuitable, then discharge may be possible to a surface water sewer or highways drain (Priority Level 4). If these options are not possible, then discharge to a foul or combined sewer (Priority Level 5) is a last resort.

Early consultation with the relevant asset owner will identify how viable a connection to any sewer or highways drain may be.

It should be noted that many potential development sites do not have a surface water body, a sewer of any kind, or a highways drain within their boundary. In this instance consideration will need to be given to infiltration to ground, or obtaining consent from adjacent land owner(s) to lay services to a suitable discharge point in the vicinity of the Site.

4.3 S2 - Surface Water Hydraulic Control

Hydraulic control of the surface water runoff from a site is required when discharging to a surface water body. There is no requirement to control the volume or rate of water discharging to ground for an infiltrating SuDS component, and any controls to volume and rate of discharge to sewers or highways drains will be determined by the relevant asset owners. Consultation with the asset owners should be sought at an early stage if a discharge of this nature is necessary.

The final discharge to a surface water body from a developed site should aim to replicate, as closely as possible, the natural (greenfield) runoff conditions from the site for a design event: a 1 in 100 year, 6-hour duration rainfall event. In order to achieve this hydraulic modelling/calculations would be undertaken to determine the greenfield runoff rate, and then propose a suitable SuDS design which limits the flow off-site in line with this rate.

Limiting the off-site flow of surface water runoff will likely require attenuating a certain volume of water within the boundary of the Site. Attenuation SuDS features can include detention basins, ponds and rain gardens. These features can also contribute to amenity, biodiversity and pollution mitigation benefits for the whole Site.

It is considered prudent to maximise the reuse of surface water runoff within the development through RWH systems, and to maximise opportunities to discharge any water to ground through unlined SuDS components if this is possible.

Even if the soil is deemed unsuitable for infiltration of all surface water runoff generated at a site following soakaway testing, it is possible that some runoff may be able to be discharged through unlined SuDS features during conveyance or temporary storage. This would reduce the volume of water discharged to a surface water body, and would provide additional pollution mitigation to address Standard 3: Water Quality.

4.4 Remaining SuDS Requirements

The remaining SuDS standards include:

- S3 – Water Quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Designing drainage for construction, operation, maintenance and structural integrity

These requirements are briefly summarised below however at this stage of appraisal for the Site they are secondary considerations; if it is determined that a viable SuDS solution can be found at the Site then accommodating the remaining standards is a matter of inclusion within the design.

It should be noted that the most significant surface water drainage obstacles for a potential development to overcome are identifying a suitable discharge location (Standard 1) and managing the land-take required by attenuation features if controlling the discharge rate (Standard 2).

Water Quality

A SuDS design for a proposed site will need to identify recognised methods for treating pollutants present within the runoff. These pollutants can include suspended solids, hydrocarbons and metals washed off surfaces during rainfall.

The type of development proposed at a site has an impact on the variety and concentration of pollutants generated; large industrial developments are generally at the higher end of the scale, and single residential developments are generally at the lower end of the scale.

Components of the SuDS design will allow for the separation of pollutants; these can include permeable surfacing, swales and rain gardens.

Amenity

It is a requirement that amenity benefit is provided to a development by the implementation of a SuDS design.

Well-designed SuDS can meet this requirement through incorporation of SuDS features with the overall site layout, for example the enhancement of soft landscaped communal areas by including surface attenuation features such as basins, swales, rain gardens and ponds.

Biodiversity

It is a requirement that biodiversity benefit is provided to a development by the implementation of a SuDS design.

SuDS can meet this requirement through planting and landscaping schemes developed at part of a site's design.

Design Considerations

Appropriate consideration needs to be given to the construction, regular operation and inevitable maintenance that a SuDS design would require over its lifetime.

In general SuDS designs which focus on shallow surface conveyance and attenuation features such as swales, basins and ponds are easier and cheaper to construct and maintain.

SuDS designs which focus on traditional water conveyance in pipes and inspection chambers, and include deep features such as geocellular storage tanks or soakaways typically involve higher construction and maintenance costs. These designs also may also have a higher proportion of embedded carbon, and may be more prone to a failure going unnoticed for lengthy periods.

5 Foul Water Discharge Requirements

5.1 Introduction

The Site falls within the River Usk Phosphorous Sensitive Area as designated by NRW; in order to prevent the water quality falling further it is a requirement that new developments within the catchment need to show phosphate (P) neutrality or betterment as part of their design.

This section of the report will outline potential options which may be employed to meet these requirements. Discussion of the options most applicable to the Site, and what works/investigation are proposed at an early stage in order to meet these requirements has been presented in Section 6.

5.2 Description of Potential Measures

On-site Treatment and Disposal Systems

Treatment of foul water may be provided on a site by a package treatment plant (PTP) if a connection to a foul sewer is not possible.

Percolation testing in line with BS 6297:2007 + A1:2008 (Code of practice for the design and installation of drainage fields for use in wastewater treatment) should be undertaken to assess whether a discharge to ground is possible.

Provided that other design considerations are taken into account, such as the depth to groundwater and the likelihood of flooding etc., a discharge to ground would likely reduce the P loading from the Site to the River Usk.

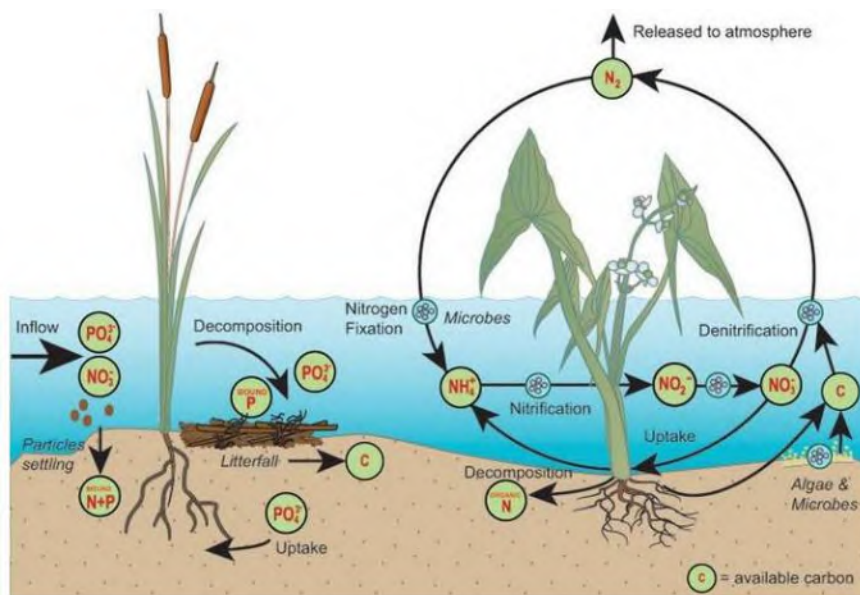
Wetland/Reed Bed Creation

Providing tertiary treatment for sewage effluent after passing through a PTP can polish the effluent and significantly reduce phosphate concentrations prior to discharge to a waste water treatment works.

Wetlands/reed beds provide a high degree of filtration for nitrogen and phosphorous pollutants through physical, chemical and biological processes as shown in Figure 5-1.

The physical removal occurs mainly by sedimentation (settling out), volatilisation, adsorption onto solids and absorption into liquids or solids. Chemical removal occurs through transformation and precipitation of the pollutants. Biological removal occurs mainly through plant uptake.

In addition to the pollutant removal benefits of wetlands, there are significant biodiversity and amenity benefits. Wetlands provide new and important habitats for insects, birds and animals. The presence of the wetlands themselves and the additional flora and fauna they sustain can provide amenity benefit for the enjoyment of the local community.

Figure 5-1 Wetland/reed bed pollutant removal

A simplified illustration of the nitrogen and phosphorus cycles in a wetland (modified from Kadlec and Knight (1996), "Treatment Wetlands"; images from IAN, University of Maryland).

Offsetting - Land Substitution on-site

Taking land out of agricultural use can reduce the P input to the receiving watercourse.

By developing an area of previously agricultural land the P loading associated with it will be removed. The replacement land use following development may have a near-zero, a lower, or potentially a higher P loading, however.

Offsetting - Land Substitution off-site

Taking other (additional) land out of agricultural use within the same catchment can have a significant effect on achieving overall P neutrality for a Site.

This is most pronounced when changing from intensive land use such as livestock and/or poultry farming to less intensive land use. This can include the reduction of overall stocking rates at livestock/poultry farms.

6 Surface and Foul Water Discharge Options

6.1 Introduction

This section presents the options and early recommended actions to achieve a compliant surface water and foul water discharge from the Site.

The surface water features and possible discharge options discussed in this Section have been shown on Drawing 4.

6.2 Surface Water Runoff Management

Discharge Destination

Soakaway testing would be undertaken across the Site at an early stage to determine if infiltration methods will provide a viable discharge destination.

BGS data suggest that Glaciofluvial Sheet Deposits are present at the Site. Information from the National Soil Resource Institute identifies the Site as being situated on Soilscape 6: freely draining slightly acid loamy soils. It is considered that there is good potential for infiltration techniques as part of a SuDS design.

During the site walkover by Hydrogeo a culverted watercourse was identified on land immediately to the west of the northern parcel of land, on land also owned by the Client. The culvert receives water from a stream and pond further up the hill to the west of the Site, and is routed to the north east. It is likely that the culvert flows below the Site and that the watercourse discharges to the River Usk.

It is proposed that the culverted watercourse is surveyed at an early stage to determine its course and condition, in order to determine whether it presents a viable discharge location for surface water runoff. It is anticipated that a sub-surface connection to this culverted watercourse would be a viable SuDS solution, providing it is present below the Site and in good condition.

The southern parcel of land at the Site has no surface water features running through it, and no evidence of a culverted watercourse below it. It is proposed that the surface water runoff from this area of the development would be conveyed to the northern parcel of land and discharged to the same culverted watercourse.

If higher-priority discharge destinations are not available at the Site then discharge to a foul sewer below the A4042 to the north east (Appendix C) would provide a viable SuDS option.

Hydraulic Control

The volume of surface water which may require attenuation within the boundary of the Site prior to discharge is dependent on a number of factors, including the amount of impermeable surface area and the infiltration rate of the soil. If infiltration SuDS features are deemed viable then the requirement to restrict the flow of surface water off-site may be reduced or removed entirely, reducing land-take for SuDS at the development.

All options for reuse of surface water runoff at the Site are to be explored as part of the site design. The reuse of surface water has the highest priority level in the SuDS Standards and the subsequent reduction of water volume requiring discharge off-site that RWH systems would bring will reduce land-take for attenuation features.

It is anticipated that attenuation features which are required could be positioned within the boundary of the Site as part of the developing site layout design and SuDS strategy design.

The lowest elevation parts of each parcel of land have been depicted on Drawing 4. These low-elevation areas would be appropriate for the siting of SuDS features such as swales, rain gardens, detention basins and soakaways.

Any shared surface water drainage features will need to be adopted by the Local authority therefore these features would be designed to be low-maintenance shallow surface features wherever possible, such as swales and vegetated detention basins.

It is proposed that some SuDS features are installed at each plot in order to reduce the attenuation volume, interception and treatment requirements at larger SuDS features at the low-elevation areas of the Site. These features include permeable surfacing at driveways, patios and pathways, and plot-scale rain gardens.

6.3 Foul Water Management

The most applicable options at the Site for the reduction of P to the River Usk SAC have been described below and indicated on Drawing 4.

Discharge Destination

Subject to any volume loading considerations and following discussion with the asset owner it is suggested that the proposed development at the Site is ultimately connected to the foul sewer below the A4042 to the north east of the Site (shown on the sewer plan attached at Appendix C).

It is proposed that treatment for waste water is provided on-site by, for example, a suitability sized Package Treatment Plant (PTP) and a reed bed system prior to discharge to the existing foul sewer.

A depiction of a low-elevation area of the Site which may be suitable for sewage treatment has been shown on Drawing 4, along with a connection to the existing foul sewer.

Phosphate Neutrality

In order to offset any increased P to the River Usk as a result of the proposed development at the Site a number of options are applicable.

The proposals for the Site involve taking existing agricultural land out of commission, thereby reducing the P loading which would have originated from this land. The main land use at the Site is currently pasture which has a lower P load than other types of farming land use.

In order to increase the P offset beyond that achieved by taking land out of commission it is proposed that a high level of sewage treatment is employed within the boundary of the Site, e.g. a package treatment plant and reed bed(s). The treatment plant and reed bed treatment prior to discharge to the public sewer would be designed to achieve phosphate neutrality.

7 Summary and Conclusions

7.1 Summary

Hydrogeo have undertaken a Foul and Surface Water Management Appraisal Report for 2 no. adjacent parcels of land at Llanellen Court, Llanellen, Monmouthshire.

This report has been prepared to promote the Site for inclusion in the Monmouthshire County Council Local Development Plan for residential land use.

7.2 Surface Water Management

Based on available site-specific data and a site walkover it is considered that there are viable options to discharge surface water runoff from the proposed development in accordance with the 2018 Statutory Standards for Sustainable Drainage Systems.

Options for the discharge destination include infiltration, if soakaway testing proves this is viable, discharge to a surface water body (a culverted watercourse), and discharge to a foul sewer.

It is considered that a scheme could be developed that does not increase the risk of flooding to the Site, and to adjacent properties and development further downstream.

It should be noted that this report only offers an appraisal of the surface water drainage options at the Site.

7.3 Foul Water Management

Based on available site-specific data and a site walkover it is considered that there are viable options for the discharge of foul water, and for achieving phosphate neutrality for the River Usk.

It is proposed to discharge foul water to a foul sewer. Treatment of sewage on-site is proposed; this would include the use of a package treatment plant and reed bed(s) which discharge to a foul sewer. The treatment plant and reed bed treatment prior to discharge to the public sewer would be designed to achieve phosphate neutrality.

Based on the proposals and recommendations described in this appraisal report there is not considered to be any significant foul or surface water drainage factors which might prevent the Site from being subject to a successful future planning application.

Drawings

Drawing 1

Surface water features plan

HYG953 Llanellen

DRAWING 1

Surface water features

KEY

-  Site boundary
-  Pond
-  Elevation contour (mAOD)
-  Main River
-  Watercourse
-  Culvert
(assumed routing - investigation required)
-  Spring

Route of culverted watercourse is assumed based on topography, orientation of entry, water features present on historic mapping and proximity of River Usk. The presence and route of the culvert below the Site is uncertain and should be verified

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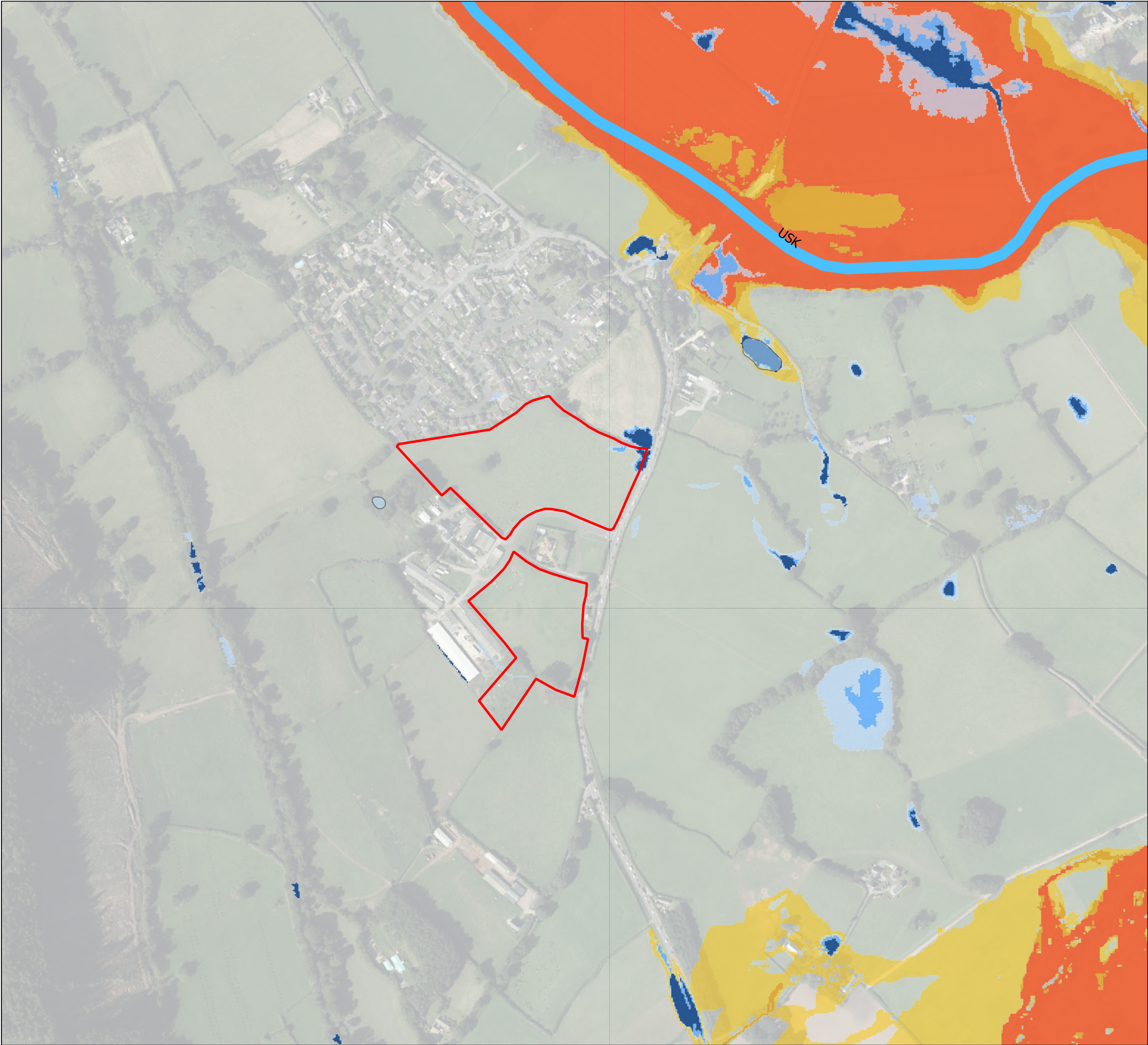
50 0 50 100 m



Date	By	Paper	Scale	Rev
08 2021	TP	A3	1:3,000	1

Drawing 2

Flooding hazard plan



HYG953 Llanellen

DRAWING 2
Flooding hazard plan

KEY
Site boundary

Main River

Watercourse

Flooding Hazard - Rivers

High Risk

Medium Risk

Low Risk

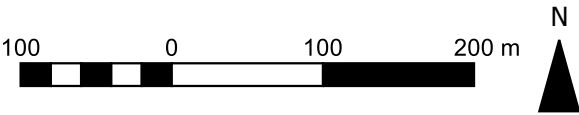
Flooding Hazard - Surface Water

High Risk

Medium Risk

Low Risk

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Date	By	Paper	Scale	Rev
08 2021	TP	A3	1:5,000	1

Drawing 3

Photo location plan

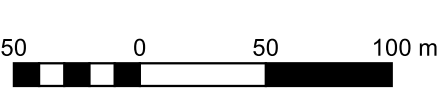


HYG953 Llanellen

DRAWING 3
Photo location plan

- KEY**
-  Site boundary
 -  Photo location

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Date	By	Paper	Scale	Rev
08 2021	TP	A3	1:3,000	1

Drawing 4

Drainage opportunities plan

HYG953 Llanellen

DRAWING 4

Drainage opportunities plan

KEY

Site boundary

— Elevation contour (mAOD)

Existing drainage features and discharge points

Pond

Main River

Watercourse

Culvert
(assumed routing - investigation required)

● Spring

Possible surface water drainage features

Surface water attenuation zone

Surface water discharge point

Possible sewage drainage features

Sewage treatment

Sewer discharge

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Drawing adapted from site block plan drawings - Refs: 1434_SK01 and 1434_SK02 - Buckle Chamberlain Partnership

20 0 20 40 60 80 m

N



Date	By	Paper	Scale	Rev
08 2021	TP	A3	1:2,000	1

Surface water discharge option to culverted watercourse if soakaways are not viable.
Discharge subject to confirmation of presence and routing below Site

SuDS conveyance and attenuation area: opportunities to include rain garden, swale and soakaway

Sewage discharge to DCWW sewer below A4042

Foul water treatment area: opportunity to include package treatment plant and reed bed

SuDS conveyance and attenuation area: opportunities to include rain garden, swale, detention basin and soakaway

SuDS conveyance and attenuation area: opportunities to include rain garden, swale and soakaway

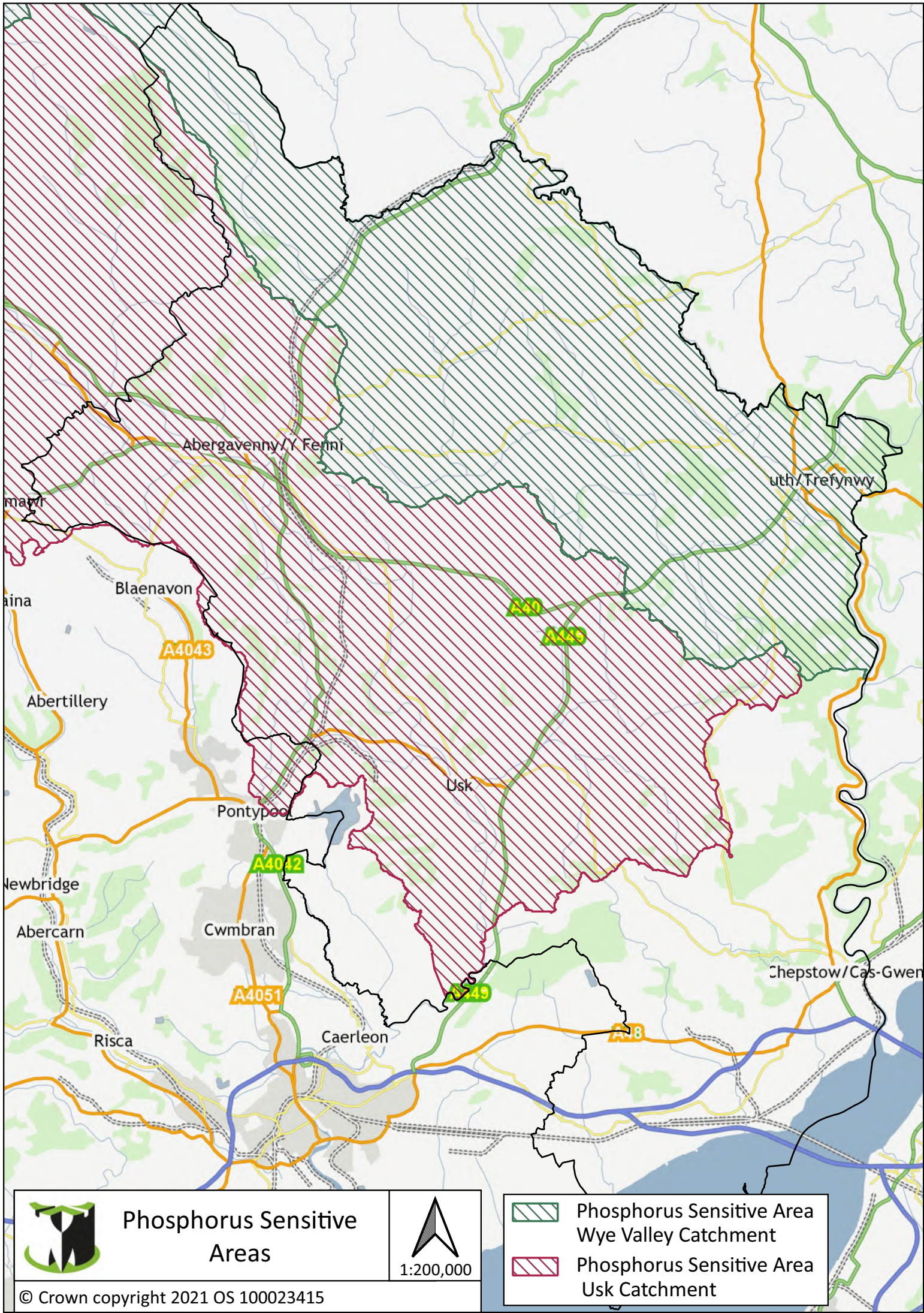
It is proposed that some SuDS features are installed at each plot:

- Permeable surfacing at all relevant areas (driveway, patio, pathways)
- Rain gardens
- Rain water harvesting systems (if viable)

Appendices

Appendix A

MMC River Usk Phosphorus Sensitive Area plan



Phosphorus Sensitive Areas

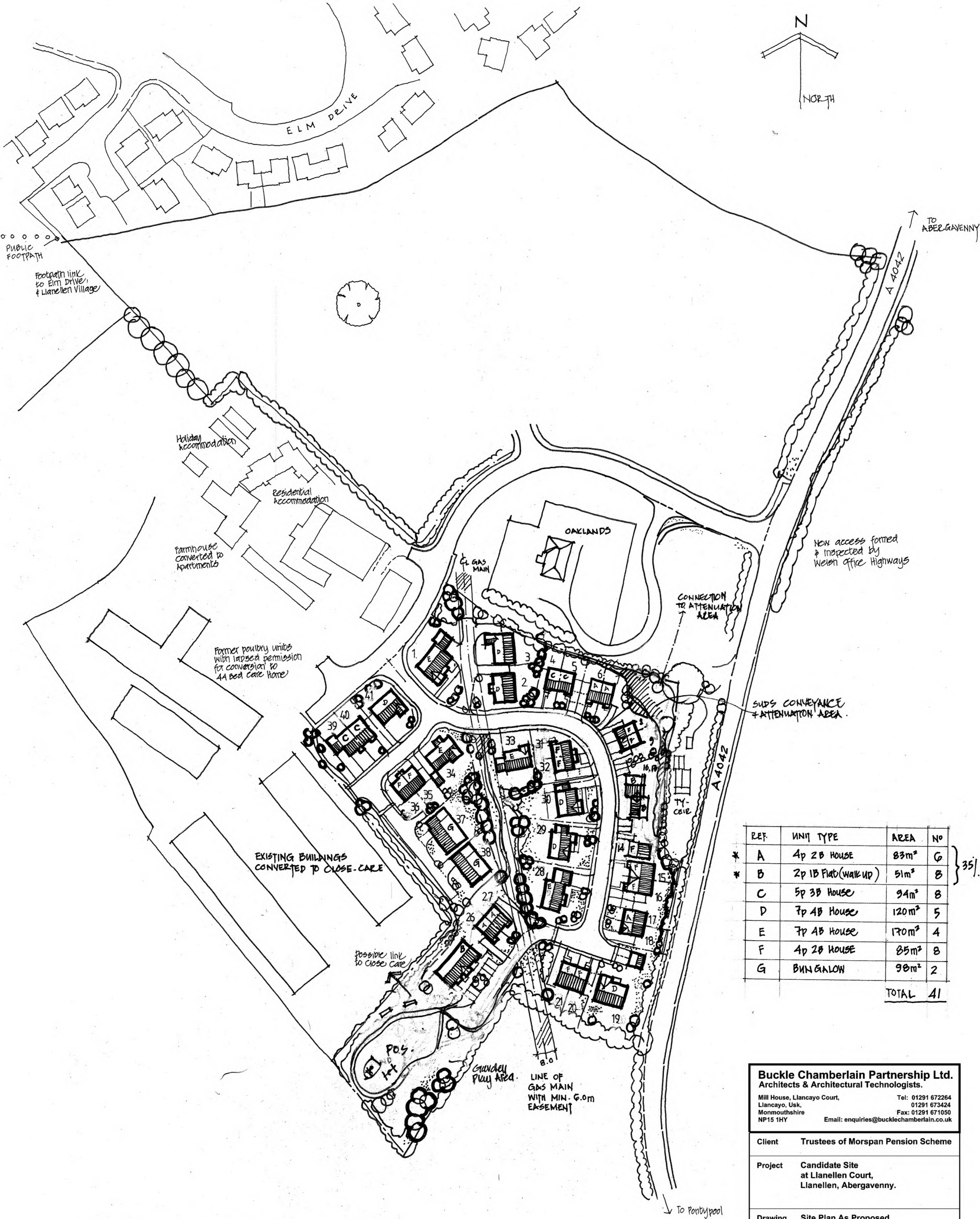


-  Phosphorus Sensitive Area Wye Valley Catchment
-  Phosphorus Sensitive Area Usk Catchment

Appendix B

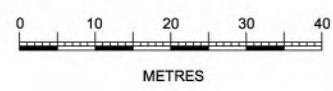
Proposed site layout plan - northern area





REF.	UNIT TYPE	AREA	NO
* A	4p 2B HOUSE	83m ²	6
* B	2p 1B Flat (WALK UP)	51m ²	8
C	5p 3B HOUSE	94m ²	8
D	7p 4B HOUSE	120m ²	5
E	7p 4B HOUSE	170m ²	4
F	4p 2B HOUSE	85m ²	8
G	BUNGALOW	98m ²	2
TOTAL			41

Site Plan As Proposed



Buckle Chamberlain Partnership Ltd.
Architects & Architectural Technologists
Mill House, Llanccayo Court,
Llanccayo, Usk,
Monmouthshire
NP15 1HY
Tel: 01291 672264
01291 673424
Fax: 01291 671050
Email: enquiries@bucklechamberlain.co.uk

Client Trustees of Morspan Pension Scheme

Project Candidate Site
at Llanellen Court,
Llanellen, Abergavenny.

Drawing Site Plan As Proposed

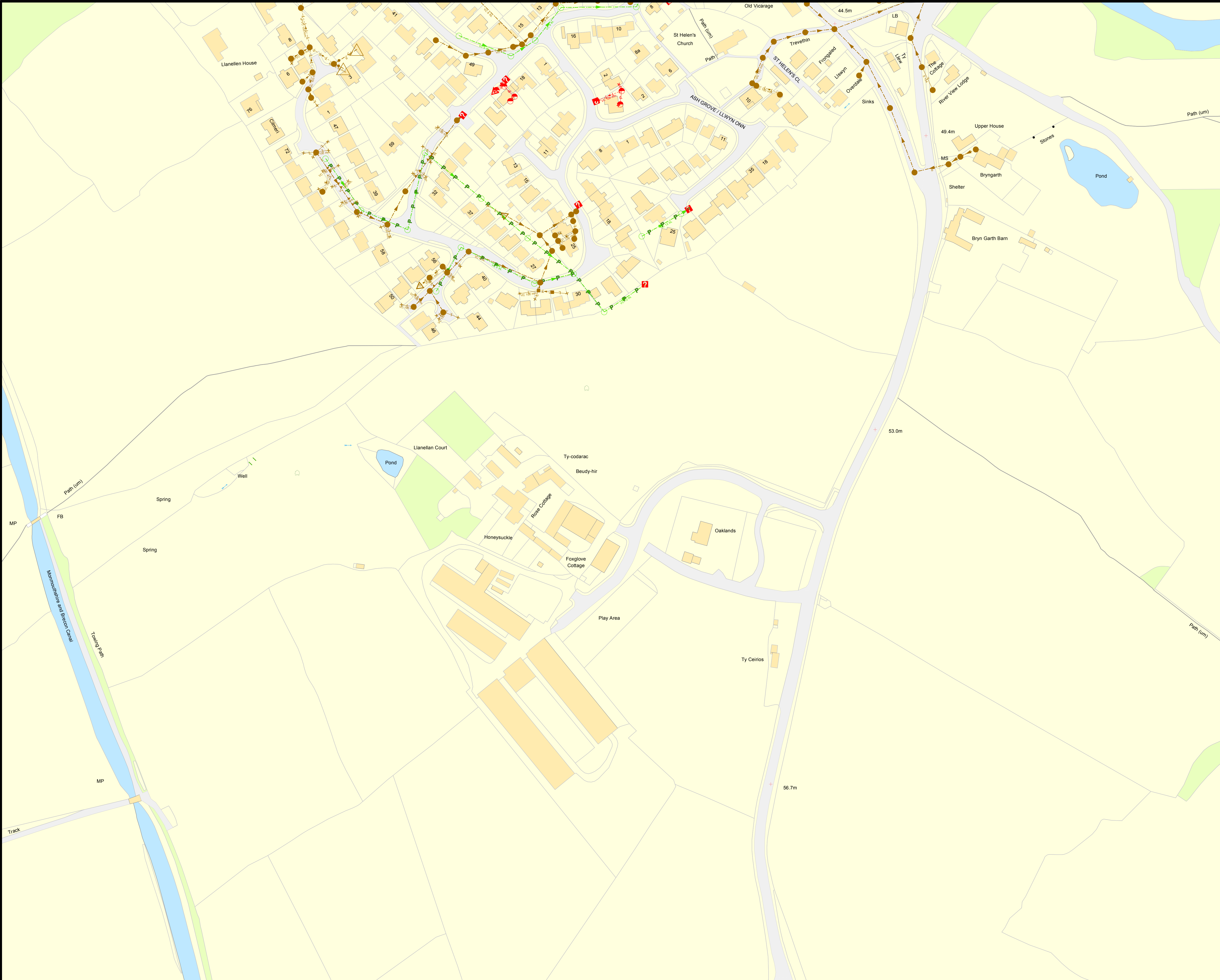
Date Aug 2021 **Scale** 1:1000 @ A2

Drawn by GB **Drawing No** 1434 [SK] 02

Checked by **Status**

Appendix C

DCWW sewer plan





**Dŵr Cymru
Welsh Water**

PPA0005955 Sewer Plan



LEGEND(Representative of most common features)

Waste network:	Foul chamber	Outfall
Surface water chamber	Lampole	Storm Overflow
Combined chamber	Rising main	Gravity sewer
Combined sewer overflow	Private sewer	Private sewer subject to Sect. 104 adoption agreement
Special purpose chamber	Pumping station	Private Sewer Transfer
Treatment works	S 104	Lateral Drain
Former S24 sewers (for indicative purposes only)		Inspection Chamber

NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cylchregr (the Company) gives the information as to the position of its underground apparatus by way of general guidance only and on the understanding that it is based on the best information available and no warranty as to its correctness is made upon it in the event of excavations or other works made in the vicinity of the Company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company is done so in accordance with statutory requirements of sections 189 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.

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Map Ref: 330250,210575
Map scale: 1:1250
Printed by: Jonathan Hobson
Printed on: 20 Aug 2021

Mrs Helen Morgan
Morspan Limited
Beech Hill Farm
Usk
Monmouthshire
NP15 1HU

Date: 23/08/2021
Our Ref: PPA0005955

Dear Mrs Morgan,

Site Address: Llanellen Court, Llanellen
Development: 55 Dwellings

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

SEWERAGE

Firstly, we note that the proposal relates to proposed development Llanellen Court and acknowledge that the site is a candidate site within the Local Development Plan (LDP).

Please note, notwithstanding the following assessment, we would advise there is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Dwr Cymru Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. As a major development, amounting to more than 10 units you will be statutorily required to consult Welsh Water and a substantive response will be issued within 28 days from the date of the notice as per the requirements of Article 2E.

Public Sewerage Network

The proposed development site is located in the immediate vicinity of a separate sewerage system, comprising foul and surface water public sewers, which drains to Llanellen Wastewater Treatment Works (WwTW).

We can advise that Llanellen WwTW does not have a phosphate permit. This matter will need to be considered further by the local planning authority.

You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales.

It is therefore recommended that the developer consult with Monmouthshire Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note.

In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Foul Water Drainage – Sewerage Network

We have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system. We advise that the flows should be connected to the foul sewer at or downstream of manhole SO30104701 located in highway/road to the North East.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dŵr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

Should a planning application be submitted for this development we will seek to control these points of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account. However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water Industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

If the development will give rise to a new discharge (or alter an existing discharge) of trade effluent, directly or indirectly to the public sewerage system, then a Discharge Consent under Section 118 of the Water Industry Act 1991 is required from Dwr Cymru / Welsh Water. Please note that the issuing of a Discharge Consent is independent of the planning process and a consent may be refused although planning permission is granted.

WATER SUPPLY

A water supply can be made available to service this proposed development. Initial indications are that a connection can be made from the 4" diameter watermain in A4042. The cost of providing new on-site watermain can be calculated upon the receipt of detailed site layout plans which should be sent to the above address.

The proposed development is crossed by strategic trunk watermain, the approximate position being shown on the attached plan. Dwr Cymru Welsh Water as Statutory Undertaker has statutory powers to access our apparatus at all times. I enclose our Conditions for Development near Watermain(s). As this a strategic trunk water main there will be a requirement (prior to commencement of any operational development) for us to complete trial holes to determine locations and depths of these assets, dependent on the depths of the mains the overall easements may increase. It may be possible for these watermain to be diverted under Section 185 of the Water Industry Act 1991, the cost of which will be re-charged to the developer. The developer must consult Dwr Cymru Welsh Water before any development commences on site.



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Mae Dwr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

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Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

SEWAGE TREATMENT

No problems are envisaged with the Waste Water Treatment Works for the treatment of domestic discharges from this site.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at developer.services@dwrcymru.com

Please quote our reference number in all communications and correspondence.

Yours faithfully,



Owain George
Planning Liaison Manager
Developer Services

Please Note that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.